U.S. ARMY FIELD ARTILLERY CENTER AND FORT SILL

ANNUAL COMMAND HISTORY

(RCS CHIS-6 [R3])

1 JANUARY 1997 THROUGH 31 DECEMBER 1997

BY

COMMAND HISTORIAN'S OFFICE

JUNE 1998

Fort Sill, Oklahoma

COMMANDER'S INTRODUCTION

This Annual Command History captures the major events at

Fort Sill during 1997. We are confident that our many important initiatives will have an impact on the Field Artillery and Total Army for years.

In 1997, Fort Sill made great progress in doctrine, training, force design, equipment, and leader development. Key efforts included improving and revising Field Artillery Officer Basic and Advanced Courses. A few of the key issues that influenced overall installation operations were budget reductions and Fort Sill's continuing commitment to a community of excellence to ensure a high quality of life for the installation's soldiers, Marines, civilians, and family members.

Fort Sill continues to serve as the Center for Fire Support for the United States Army and Marine Corps. The Field Artillery also continues in its proud tradition of excellence in the service to our nation and our allies through leadership and combat developments.

(original signed)
LEO J. BAXTER
Major General, USA
Commanding

PREFACE

The 1997 Annual Command History for the U.S. Army Field Artillery Center and Fort Sill follows the decision-making process as closely as possible. Through messages, staff reports, fact sheets, correspondence, briefings, and other documentation, the Command Historian's Office has recreated as closely as possible how the Center and Training Command made key decisions concerning training, leader development, doctrine, force design, equipment requirements, and mission support. Because the Center and Training Command were involved in many diverse activities during the year, the

Command Historian's Office under the direction of the Commanding General selected only those activities deemed to be the most historically significant to include in the History.

Preserving historical documents forms a vital part of the historian's work. After they are collected from the various Center and Training Command organizations during the process of researching, they are filed in the records and documents collection in the Command Historian's Office. All documents are available for use by Center and Training Command staff, other U.S. governmental agencies, and private individuals upon request.

Because new documents are often found after research and writing are completed, this contemporary history is subject to revision. As new documents are discovered, interpretations and conclusions will change. Comments and suggested changes should be directed to the Command Historian's Office.

In the process of researching and writing the History, the historian becomes indebted to many people for their advice and assistance. The Command Historian's Office would like to thank the people who provided their technical expertise. Without their help writing the history would have been far more difficult.

(original signed)
BOYD L. DASTRUP, Ph.D.
Command Historian
U.S. Army Field Artillery Center
and School

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SUPPORT

CHAPTER ONE
MISSION, ORGANIZATION, AND MISSION SUPPORT

MISSION

Influenced by new field artillery technology introduced after the Spanish-American War of 1898, the development of indirect fire, and inadequately trained Field Artillerymen, the War Department opened the School of Fire for Field

Artillery at Fort Sill, Oklahoma, in 1911. War Department General Orders No. 72, dated 3 June 1911, directed the school to furnish practical and theoretical field artillery training to lieutenants, captains, field grade officers, militia officers, and noncommissioned officers.[1]

Composed of the U.S. Army Field Artillery School (USAFAS), the U.S. Army Field Artillery Training Center (USAFATC), and the Noncommissioned Officers Academy (NCOA), Fort Sill's Training Command continued the tradition established by the School of Fire at the beginning of the century. In 1997 Training Command used resident and nonresident courses to train officers and enlisted personnel in the tactics, techniques, and procedures to employ fire support systems. Training Command also developed and refined warfighting doctrine and designed units for fighting on future battlefields.[2]

ORGANIZATION

New Commanding General

On 6 June 1997, Major General Leo J. Baxter replaced Major General Randall L. Rigby as the commanding general of the U.S. Army Field Artillery Center and Fort Sill (USAFACFS). Following graduation from the University of North Dakota, General Baxter earned his commission as a second lieutenant of Field Artillery from the Field Artillery Officer Candidate School at Fort Sill, Oklahoma, in 1970.

Over the years, General Baxter served in a wide variety of command and staff assignments. His tours of duty in Germany included command of the 2nd Battalion, 6th Field Artillery, 3rd Armored Division. He also served as the Executive Officer of the 3rd Armored Division Artillery. In the 3rd Infantry Division he commanded the division artillery and served as the Assistant Division Commander for Support. General Baxter had peacekeeping experience as a member of the United Nations Truce Supervision Organization in Palestine, serving in Egypt, Israel, and the Sinai Desert. His stateside assignments were in the 4th Infantry Division at Fort Carson, Colorado, where he served as Executive Officer of the 1st

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[1]War Department, General Order No. 72, 3 Jun 1911, Doc I-1; Wilbur S. Nye Carbine and Lance: The Story of Old Fort Sill (Norman, OK: University of Oklahoma Press, reprinted 1974), pp. 320-29.

[2]1993 USAFACFS Annual Command History (ACH), pp. 1-2.

Battalion, 29th Field Artillery, and Operations Officer of the 4th Infantry Division Artillery. As a captain at Fort Sill, he was the Executive Officer to the Assistant Commandant of the Field Artillery School and commanded Battery A, 1st Battalion, 17th Field Artillery. In subsequent tours as a colonel and brigadier general, he served as Chief of Staff of the Field Artillery Center and later as Deputy Commanding General for Training. His assignments during three tours with the Total Army Personnel Command at Alexandria, Virginia, included Assignment Officer in the Field Artillery Branch, Field Artillery Colonel Assignment Officer, Chief of the Combat Arms Division of the Officer Personnel Management Directorate, Director of Officer Personnel Management, and finally Commanding General.

In addition to his bachelors degree, General Baxter earned a masters degree in personnel management from Central Michigan University and attended the Advanced Management College of Stanford University. His military education included the Field Artillery Officer Advanced Course, the Armed Forces Staff College, and the Army War College.

General Baxter's awards included the Distinguished Service Medal, Legion of Merit with Oak Leaf Cluster, the Meritorious Service Medal with four Oak Leaf Clusters, the Joint Service Commendation Medal, the Army Commendation Medal, the Army Achievement Medal, and the United Nations Service Medal.[3]

The New Deputy Commanding General for Training

In June 1997 Brigadier General Toney Stricklin became the new Deputy Commanding General for Training at the U.S. Army Field Artillery Center and Fort Sill and Assistant Commandant of the Field Artillery School. General Stricklin was commissioned in May 1970 after graduating from Officer's Candidate School. He earned a bachelors degree from Cameron University and a masters degree in international relations from Salve Regina University, Newport, Rhode Island.

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[3]Official Biography, General Baxter, Doc I-1A; Change of Command Ceremony Program, 6 Jun 97, Doc I-2; "Baxter to Command Fort Sill," Fort Sill Cannoneer, 8 May 97, p. 1a, Doc I-3.

Over the years General Stricklin has served in a variety of command and staff assignments in the United States, Germany, Korea, and Vietnam and was Ranger, Airborne, and Pathfinder qualified. His most recent assignment at Fort Sill was Director of the Directorate of Combat Developments in the Field Artillery School.

General Stricklin's decorations included the Defense Superior Service Medal, the Legion of Merit (2nd Oak Leaf Cluster), the Bronze Star Medal, and the Meritorious Service Medal (3rd Oak Leaf Cluster).[4]

MISSION SUPPORT

The Budget

After making adjustments to the Fiscal Year (FY) 1997 budget, Fort Sill faced another round of budget reductions in FY 1998. In October 1996 the installation received notification that the President had signed the FY 1997 appropriations bill late in the previous month. Although budget for FY 1997 was less than the previous fiscal year, the signed appropriations bill still provided some good news. Rather than having a budget of $106 million as projected in the command operating budget (COB) for FY 1997 submitted to the U.S. Army Training and Doctrine Command (TRADOC) in July 1996, Fort Sill had $118 million.[5]

Meanwhile, Fort Sill started working on the budget for FY 1998. As directed by TRADOC, the installation prepared for a budget reduction from $118 million in FY 1997 to $104 million. Although Fort Sill had the flexibility to spend the money as it saw fit, TRADOC outlined resource imperatives in its budget guidance that had to be met. According to the Deputy Chief of Staff for Resource Management at TRADOC, Fort Sill had to train the load, support Army Training XXI and Force XXI initiatives, invest in the future, upgrade unsatisfactory barracks, and win the infrastructure war through building demolition to posture for future affordable facilities.[6]

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[4]"Lennox Departing for Fort Hood," Fort Sill Cannoneer, 5 Jun 97, p. 1a, Doc I-4; Official Biography, BG Toney Stricklin, Doc I-5.

[5]Memorandum for See Distribution, subj: Beginning FY97 Funding Operations, 28 Oct 96, Doc I-6; Msg, subj: FY97 Continuing Resolution Authority Msg 5 Released, 7 Oct 97, Doc I-7; Msg, subj: FY 1997 Continuing Resolution Authority Msg 4, 1 Oct 96, Doc I-8; Msg, subj: FY 1997 Continuing Resolution Authority Msg, 26 Sep 96, Doc I-9; Briefing, subj: FY97 Appropriation Markup, Jan 97, Doc I-10.

[6]Memorandum for See Distribution, subj: FY98 TRADOC Budget Guidance, 29 Apr 97, Doc I-11; Briefing, subj: FY98 TRADOC Budget Guidance, undated, Doc I-12; Briefing, subj: FY98 TRADOC Budget Guidance, May 97, Doc I-13; Briefing, subj: FY97 Appropriation Markup, Jan 97; Memorandum for See Distribution, subj: FY97 Appropriation TRADOC Budget

Guidance, undated, Doc I-14; Memorandum for See Distribution, subj: FY97 Appropriation TRADOC Budget Guidance, 8 Jan 97, Doc I-15; Memorandum for See Distribution, subj: FY97 Administrative Instruction for the Phased Obligation Plan on the Appropriations TRADOC Budget Guidance, 10 Jan 97, Doc I-16.

To meet the reductions and the TRADOC imperatives Fort Sill used the zero-based budget process to formulate a budget that included Key Enabling Investment (KEI) initiatives and Bold Grant submissions. Basically, the zero-based budget process required directorates to start with a base of no money, to estimate their needs for civilian salaries and other costs for each function within their activity, and to stay within the budget ceiling that often meant eliminating civilian positions. As an incentive for investing in the future, TRADOC developed the KEI program. For FY 1998 the Commanding General of TRADOC committed $20 million in Operation and Maintenance Army (OMA) funds from the command's budget and $10-12 million in Other Procurement Army Two (OPA2) funds and actively sought additional funding from the Department of the Army. Through the KEI program Fort Sill had the opportunity of proposing projects for possible one-time funding by TRADOC. The projects had to support the TRADOC commander's futuristic views, such as distance learning, multimedia courseware development, and Classroom XXI initiatives, to be considered. At the same time garrison activities could submit Bold Grants to obtain additional funding for base operations or mission support. The Bold Grant initiative focused on providing venture capital funding for promising base operation investment opportunities without taxing the limited resources of the installation. At the same time TRADOC did not intend Bold Grants to be a recurring funding source for projects that required annual resources.[7]

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[7]1996 USAFACFS ACH, p. 3; Briefing, subj: FY98 TRADOC Budget Guidance, May 97; Memorandum for See Distribution, subj: FY98 Command Operating Budget - KEI Investments and

Unfinanced Requirements, 12 Jun 97, Doc I-17; Msg, Barbara Miliam, Directorate of Resource Management, to Jimmy Parker, DOIM, subj: Priorities for FY98 KEIs, 19 Jun 97, Doc I-18; KEI Summary, 21 Oct 97, Doc I-19; FY 98 Command Operating Budget (Extract), 1 Jul 97, pp. 1-3, Doc I-20; Memorandum for See Distribution, subj: FY98 TRADOC Budget Guidance, 29 Apr 97; Memorandum for See Distribution, subj: FY98 COB - Phase II OMA TRADOC Budget Guidance, 13 May 97, Doc I-21; Memorandum for See Distribution, subj: FY COB - Phase I Administrative Instruction, 6 May 97, Doc I-22; Memorandum for See Distribution with Encls, subj: FY98 BASOPS Opportunity Leveraging and Development (BOLD) Grants, 7 May 97, Doc I-23; Memorandum for See Distribution, subj: FY98 BASOPS Opportunity Leveraging and Development (BOLD) Grants, 12 Jan 98, Doc I-24; Briefing, subj: FY98 BOLD Grants, Jul 97, Doc I-25.

After much work Fort Sill completed its command operating budget and submitted it along with its prioritized KEIs and Bold Grants to TRADOC. On 18 June 1997 General Baxter wrote:

> The resources provided for the FY 98 Command Operating Budget for Fort Sill are sufficient to train the load. However, without additional funding we cannot move forward to support the TRADOC Force XXI and Army Training XXI initiatives as outlined in the TRADOC imperatives. We are unable to fund or fix the serious erosion of the base infrastructure, while facing increasing costs of utilities and service contracts.[8]

As the General observed, the budget reduction for FY 1998 would severely test the installation's ability to fulfill its mission and maintain its facilities.[9] Tying the past and future together, he explained in clear terms:

> It is apparent that we have stretched our ingenuity in downsizing this installation to meet the resource constraints of the past few years. We have reduced our workforce to one person deep throughout the installation and combined duties in BASOPS [base operations]. Future fund reductions will require bold actions and inevitably will impact on the training mission.[10]

The General's observations served a two-fold purpose by tersely explaining the impact of past budget reductions on Fort Sill and simultaneously providing a serious warning about the effect of future cuts.[11]

In the concluding paragraph of his cover letter to Fort Sill's command operating budget for FY 1998, General Baxter

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[8]FY98 Command Operating Budget, 1 Jul 97, p. 1.

[9]Ibid.

[10]Ibid.

[11]Ibid.

succinctly pointed out the real significance of the impending budget reduction. After noting that Fort Sill would provide the "best support possible" to its soldiers, Marines, and their families given the resource constraints, the General responded, "If reductions continue in FY 99, we will be forced to eliminate significant installation support activities to sustain our core missions at the marginal level."[12] Because of this, Fort Sill asked for additional funding in critical areas in the form of KEIs and Bold Grants.[13]

[12]Ibid.

[13]Ibid., p. 2

Early in 1998, Fort Sill received the FY 1998 Appropriation TRADOC Budget Guidance. Rather than the $104 million projected in the command operating budget of mid-1997, Fort Sill would have $107 million. Although this figure still represented a reduction from the previous fiscal year, it was not as drastic as it could have been. Given the level of funding, Fort Sill did not anticipate any additional decrements being taken. Early planning for FY 1998 prevented this.[14]

As in past resource decreases, the one for FY 1998 also meant a reduction in force for civilians. In a briefing to Fort Sill leaders late in May 1997, the Directorate of Resource Management (DRM) identified sixty-three civilian positions for elimination based upon the zero-based budget process with all of them coming from garrison activities. Through voluntary early retirement authority/voluntary separation incentive program actions and other efforts, only thirty-seven employees received notifications in July 1997 that their jobs were being abolished on 1 October 1997. Fort Sill offered seven employees positions of equal grade, and thirteen received offers of positions of lower grade. The remaining seventeen failed to receive an offer. Continued efforts to place affected employees during the remaining months of the fiscal year decreased the number of separations to three.[15]

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[14]Memorandum for See Distribution with Encls, subj: FY98 Appropriation TRADOC Budget Guidance, 13 Jan 98, Doc I-26; Briefing, subj: FY98 Appropriation Markup, 15 Jan 98, Doc I-27.

[15]Briefing, subj: FY98 TRADOC Budget Guidance, May 97; Memorandum for See Distribution, subj: FY98 COB - Phase II OMA TRADOC Budget Guidance, 13 May 97; "Sixty-three Jobs Targeted for Elimination at Fort Sill," Fort Sill Cannoneer, 29 May 97, p. 1a, Doc I-28; "RIF Notices Issued," Fort Sill

Cannoneer, 31 Aug 97, p. 1a, Doc I-29; Msg, Sandy Mayhall, Directorate of Civilian Personnel (DCP), to Command Historian, subj: Annual Command History, 23 Jan 98, Doc I-30.

Although Base Realignment and Closure (BRAC) was new to Fort Sill in the mid-1990s, the process had its origins in the 1960s. Understanding that the Department of Defense (DOD) had to reduce its base structure that had been created during World War II and the Korean War, President John F. Kennedy directed Secretary of Defense Robert S. McNamara to develop and implement an extensive base realignment and closure program to adjust to the realities of the 1960s. The Office of the Secretary of Defense (OSD) subsequently established the criteria to govern the selection of bases without consulting Congress or the military. Under McNamara's guidance DOD closed sixty bases early in the 1960s without Congress or other government agencies participating. In view of the political and economic ramifications of the closures, Congress decided that it had to be involved in the process and passed legislation in 1965 that required DOD to report any base closure programs to it. However, President Lyndon B. Johnson vetoed the bill. This permitted DOD to continue realigning and closing bases without congressional oversight throughout the rest of the 1960s.[16]

Economic and political pressures eventually forced Congress to intervene in the process of realigning and closing bases and to end DOD's independence on the matter. On 1 August 1977 President Jimmy Carter approved Public Law 95-82. It required DOD to notify Congress when a base was a candidate for reduction or closure; to prepare studies on the strategic, environmental, and local economic consequences of such action; and to wait sixty days for a congressional response. Codified as Section 2687, Title 10, United States Code, the legislation along with the requirements of the National Environmental Policy Act (NEPA) permitted Congress to thwart any DOD proposals to initiate base realignment and closure studies by refusing to approve them and gave it an integral role in the process.[17]

As economic pressures mounted, the drive to realign and close military installations intensified. In 1983 the President's Private Sector Survey on Cost Control (the Grace Commission) concluded in its report that economies could be made in base structure and simultaneously recommended the creation of a nonpartisan, independent commission to study base realignment and closure. Although nothing came of this

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[16]1995 USAFACFS ACH, pp. 17-18.

[17]Ibid., p. 18.

recommendation, the defense budget that had been declining since 1985 and that was predicted to continue to decrease in coming years prompted the Secretary of Defense to take action. In 1988 the Secretary of Defense recognized the requirement to close excess bases to save money. In view of this, the Secretary of Defense chartered the Commission on Base Realignment and Closure in 1988 to recommend military bases within the United States for realignment and closure.[18]

[18]Ibid., pp. 18-19.

In the meantime, Congress passed Public Law 100-526. It provided the statutory basis for a one-time base realignment and closure and furnished partial relief from certain statutory impediments. Public Law 100-526 waived a portion of NEPA requirements, delegated property disposal authority to DOD, and expedited congressional review of BRAC recommendations. Passage of this law constituted a recognition that realigning and closing bases could save money without harming national security and that Congress would support such measures.[19]

The 1988 BRAC commission issued its report in December 1988. It proposed closing eighty-six military installations (sixteen major) and realigning thirteen others. In addition, the commission designated forty-six installations for increases in mission because units and activities would be relocated to them as a result of the closures and realignments. Approved by the Secretary of Defense and Congress, the commission's recommendations led to the realignment and closure of fourteen of the sixteen major installations by February 1995 with the other two to be realigned or closed by 2000.[20]

The waning of the Cold War early in the 1990s reduced international tensions and the threat of war and concurrently led DOD to conclude that its budget would continue to decline even more, and this further escalated the need for realigning and closing bases. Because the base closure and environmental impact studies required under Section 2687 would take one to two years to complete, DOD developed a list of candidates for closure and realignment in January 1990. Before any real action on the studies could begin, Congress passed legislation in November 1990, and the President signed it as Public Law 101-510. The law required DOD to review its base structure without regard to the January 1990 list. Working from the BRAC experience of 1988, the new law authorized independent

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[19]Ibid., p. 19.

[20]Ibid., pp. 19-20.

Presidential BRAC commissions in 1991, 1993, and 1995 to review the Secretary of Defense's recommendations for base realignment and closure in those years.[21]

[21]Ibid., p. 20.

Outside of moving the Joint Readiness Training Center (JRTC) from Fort Chaffee, Arkansas, to Fort Polk, Louisiana, as a result of the 1991 BRAC, the BRAC process had little influence upon Fort Sill over the years. The 1995 BRAC, however, made a significant impact. In July 1995 the BRAC commission advised closing Fort Chaffee, Arkansas, a sub-installation of Fort Sill, Oklahoma, as an Active Component (AC) facility. The President approved the 1995 BRAC recommendations on 15 July 1995, and they became Public Law 101-510 on 28 September 1995. Based upon the law, the Commanding General, Fort Sill, had to close Fort Chaffee except for the minimum essential ranges, facilities, and training areas required for a Reserve Component (RC) training enclave for individual and annual training and had to dispose of excess properties to the private sector. This involved creating a RC training enclave that would license the Arkansas Army National Guard (ARARNG) to operate it with U.S. Army Reserve (USAR) activities being tenants and realigning current tenants from Fort Chaffee. Fort Sill also had to transfer Fort Chaffee area support responsibilities to Fort Sill, establish an Arkansas Army National Guard garrison at Fort Chaffee, and cancel the installation's designation as a U.S. Army Forces Command (FORSCOM) mobilization station and contingency mission site. In addition, Fort Sill had to ensure that the property would be declared excess and would be turned over to the private sector environmentally clean.[22]

In September 1996 Fort Sill published a plan to execute the public law and to assure an orderly closure of Fort Chaffee. According to Public Law 101-510, Fort Chaffee would be closed as an AC military installation effective 30 September 1997 with the mission for maintaining the RC enclave passing to the Arkansas Army National Guard on 1 October 1997. Subsequent to that date, a federal government transition team would coordinate the disposal of all remaining excess equipment, material, and real property in coordination with the United States Property and Fiscal Office. A completion date of Fiscal Year (FY) 2001 for the disposal was established.[23]

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[22]Ibid., pp. 20-21; 1996 USAFACFS ACH, p. 16.

[23]Ibid., pp. 16-17.

Fort Sill's closure plan, which was a working document subject to revisions as needed, envisioned a three-phase approach to the transfer. During phase one (the planning phase), plans for the drawdown would be written. This involved writing a detailed plan of RC enclave and Fort Chaffee residual dimensions, ownership, and base operations support; producing a comprehensive plan for administering annual training for 1997; and transferring annual training for 1998 to the RC. In phase two (the transition phase) the transfer from an active Army installation to the Arkansas Army National Guard operated enclave would transpire. Tenant activities could move, if necessary, to new facilities or locations. Designation of Fort Chaffee as a FORSCOM mobilization station and contingency mission site would be canceled, while administration of 1997 annual training funding would be continued by Fort Sill/Fort Chaffee. At the same time U.S. Army Garrison (USAG) support activities would turn in equipment, close buildings, prepare real property for turn in, and reduce support functions. The U.S. Army Garrison, however, would continue post support through FY 1997.[24]

Phase three (the caretaker phase) would last from 1 October 1997 to disposal in FY 2001. During those years, a transition team of sixty personnel, which would be reduced to forty personnel in the final year, would prepare Fort Chaffee's excess property for final closure, perform real property maintenance in the excess area as required, dispose of personal property, and secure government property until properly disposed. Base operations support would be assumed by the Arkansas Army National Guard for the RC enclave. Upon the completion of all required environmental cleanup for the excess property and transfers, the third phase would conclude. The separation of the transition team would mark the end of U.S. Army Garrison presence on Fort Chaffee.[25]

On 27 September 1997 a change of command ceremony closed an era at Fort Chaffee. That day, official command and control of the installation passed from the U.S. Army to the Arkansas Army National Guard when the U.S. Army Garrison was inactivated. The installation became officially known as the Fort Chaffee Maneuver Training Center.[26]

Nevertheless, Fort Sill still had vital role in Fort Chaffee operations after 1 October 1997, the official transition date. During the final phase, Fort Sill centered

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[24]Ibid., p. 17.

[25]Ibid., p. 18.

[26]Interview, Dastrup with Karen Jordan, Management Division, DRM, 8 Jan 98, Doc I-31; "Chaffee Garrison Colors to be Cased Saturday," Fort Sill Cannoneer, 25 Sep 97, p. 1a, Doc I-32; "Chaffee Garrison Colors to be Cased at Ceremony," Fort Sill Cannoneer, 18 Sep 97, p. 1a, Doc I-33.

its attention on transferring excess, nonessential property from the Army to the Local Redevelopment Authority, a group of local community leaders. Specifically, Fort Sill's Directorate of Environmental Quality (DEQ) provided oversight to the base transition team, which had the responsibility of transferring the excess property and ensuring that environmental cleanup was properly conducted. In the meantime, the Directorate of Logistics (DOL) assisted the base transition team on logistical actions, such as property book support, while the Directorate of Contracting (DOC) furnished contracting assistance. Other Fort Sill agencies, such as the Directorate of Plans, Training, and Mobilization (DPTM), the Directorate of Public Works (DPW), and the Staff Judge Advocate (SJA), supplied assistance in their areas of expertise. Perhaps, the most important Fort Sill involvement centered on writing a new disposal plan to transfer excess property to the Local Redevelopment Authority.[27]

Fort Sill and Power Projection

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[27]Briefing, subj: Fort Chaffee BRAC Update, 4 Dec 97, Doc I-34; Memorandum for See Distribution, subj: Summary of 4 Dec 97 BRAC Inprocess Review (IPR) for the Chief of Staff, 8 Dec 97, Doc I-35; Interview, Dastrup with Jordan, 8 Jan 97; "Chaffee Garrison Colors to be Cased at Ceremony," pp. 1a-2a.

The unexpected end of the Cold War at the beginning of the 1990s caused the United States to restructure its national military strategy. Rather than depending upon forward deployed military forces in Europe as it had done for over forty years, the new strategy focused on deploying military forces from the continental United States (CONUS). Equally important, the new military strategy embraced the principles of deterrence, forward presence, crisis response, and reconstitution and required Army installations, such as Fort Sill, Oklahoma, to have the ability of responding rapidly to regional crises throughout the world.[28]

[28]1994 USAFACFS ACH, pp. 18-19.

As in past years, Fort Sill participated in deploying and redeploying units and individual soldiers in support of the new national military strategy in 1997. Early in the year, Fort Sill learned that III Armored Corps Artillery would be required to support Operation Joint Guard, the North Atlantic Treaty Organization (NATO) peacekeeping force in Bosnia. A message of January 1997 set the wheels in motion that eventually led to the deployment of two corps artillery meteorological units (Headquarters and Headquarters Battery, 212th Field Artillery Brigade and 75th Field Artillery Brigade meteorological detachments) to Bosnia in June 1997.[29] In the meantime, Fort Sill redeployed two National Guard units from Bosnia in June 1997: E Battery, 139th Field Artillery Target Acquisition Battery and Headquarters and Headquarters Battery, 35th Meteorological Unit. In July 1997 Fort Sill mobilized and trained a National Guard unit, Detachment 1, Headquarters and Headquarters Battery, 45th Field Artillery Meteorological to replace III Armored Corps Artillery's 212th and 75th meteorological units that had deployed earlier to Bosnia.[30]

Fort Sill's Radar Approach Control

Established in 1959, the Army Radar Approach Control (ARAC) at Fort Sill furnished air traffic control for Henry Post Airfield on Fort Sill, the Lawton municipal airport, the Duncan Haliburton Airport, and other airports in the surrounding area. Through the mid-1980s Henry Post Airfield was home for a U.S. Army Forces Command helicopter battalion, two helicopter companies, a medical evacuation platoon, and ten to fifteen U.S. Army Field Artillery Center and Fort Sill helicopters and airplanes. However, in the mid-1980s Fort Sill started losing Army aircraft because of budget cuts. By the mid-1990s Fort Sill had lost most of its aircraft through restationing and inactivations. At the end of Fiscal Year 1996, for example, Fort Sill had only a few fixed-wing aircraft and three temporary duty medical evacuation helicopters at Henry Post Airfield.[31]

In the meantime, non-Army air traffic took up most of the

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[29]Msg, Henry Holzheuser, Chief, Plans and Operations Branch, DPTM, to Sandy Posey, DPTM, subj: Annual Historical Review Ops--Tng Div, 18 Dec 97, Doc I-36; Msg, Holzheuser, to Dastrup, subj: Annual Historical Review Ops--Tng Div, 6 Jan 98, Doc I-37; Operations Order 97-012, Annex A, Doc I-38.

[30]Msg, Holzheuser to Dastrup, subj: Annual Historical Review Ops--Tng Div, 6 Jan 98.

[31]Fact Sheet, subj: Fort Sill's ARAC, 29 Mar 96, Doc I-39; Briefing, subj: Fort Sill Air Traffic Control, 1997, Doc I-40; Interview, Dastrup with Mitch Pinion, Dep Dir, DPTM, 8 Jan 98, Doc I-41; Memorandum, DPTM to Suzanne Hogan of U.S. Congressman J.C. Watt's Office, 2 Apr 97, Doc I-42.

Fort Sill ARAC's time. In 1995, for example, the ARAC handled 170,670 air movements. This included approaches and departures at multiple airfields and overflights. Of this total, only twenty-two percent of the flights were Army. Forty-five percent of the flights were Air Force, and thirty-three percent were civilian.[32]

[32]Fact Sheet, subj: Fort Sill's ARAC, 29 Mar 96.

In view of the budget cuts of the 1990s, the aging equipment, such as the ASR-8 airport surveillance radar that would cost several million dollars to replace, the reduction in the number of Army aircraft at Fort Sill, and the accompanying decline in Army aviation traffic, the U.S. Army had to reconsider the rationale for maintaining the ARAC. Late in 1995, the U.S. Army Aeronautical Services Agency (USAASA) reviewed the need for the ARAC and concluded that it should be closed. In January 1996 the USAASA notified the Federal Aviation Administration (FAA) of its intent to return the currently delegated approach control authority to it. The notification stated that U.S. Army would not abruptly cease approach control operations in the Lawton/Fort Sill area that might disrupt commercial or general aviation activities and also recommended the development of a transition plan.[33]

Because Sheppard Air Force Base used Henry Post Airfield and Fort Sill's ARAC for Euro-NATO Joint Jet Pilot training, the U.S. Air Force reacted vigorously to the recommendation and pushed for some sort of accommodation. After extensive negotiations in 1996-97, the U.S. Army and U.S. Air Force reached an understanding. According to a memorandum of agreement signed by both services in March 1997, Fort Sill would continue to operate the ARAC until the U.S. Air Force could install a new digital radar with a projected operational date of 2004. After that date Sheppard Air Force Base would assume approach control. Also, Fort Sill would continue to operate and maintain a precision approach radar at Henry Post Airfield for the foreseeable future. Moreover, the existing level of funding by both services would continue until the U.S. Army relinquished control responsibility to the U.S. Air Force.[34] Despite this, large budget reductions projected for Fiscal Year 1999 at Fort Sill forced the installation to reexamine the ARAC issue later in 1997. Lacking sufficient funding to operate the ARAC facility, Fort Sill leaders discussed the possibility of closing the it. As of 31 December 1997, however, the Commanding General of Fort Sill

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[33]Memorandum for Record, subj: Historical Funding Trend, 8 Jan 98, Doc I-43; Briefing, subj: Fort Sill Air Traffic Control, 1997; Fact Sheet, subj: Fort Sill's ARAC, 29 Mar 96; Memorandum of Agreement between the U.S. Army and U.S. Air Force Concerning Approach Control Services for Fort Sill, Oklahoma, Mar 97, Doc I-44; Memorandum, subj: Protected Airspace for Non-radar Missed Approach Procedures at Lawton Municipal Airport, 19 May 94, Doc I-45; Memorandum for Chief of Staff, subj: Fort Sill ARAC, 9 Nov 95, Doc I-46.

[34]Memorandum of Agreement between the U.S. Army and the U.S. Air Force concerning Approach Control Services for Fort Sill, Oklahoma, Mar 97; Briefing, subj: Fort Sill Air Traffic Control, 1997.

had not yet reached a decision.[35]

Project Millennium

[35]Interview, Dastrup with Pinion, 8 Jan 98.

During the latter months of 1997, the Fort Sill Museum focused considerable attention on planning and implementing Project Millennium. The project consisted of eight major initiatives to improve museum operations and to provide better educational support. They included major renovations of historic buildings, such as the cavalry barracks, the guardhouse, and the Quartermaster Corral. The Museum also designed a new museum facility as part of Project Millennium to depict the military history of the American Southwest and to house large-scale field artillery displays.[36]

Center for Environmental Initiatives and Hands On Training

In 1992 Fort Sill expanded its commitment to environmental issues with the establishment of an Environmental Training Center (ETC). In addition to addressing growing concerns over the environment within the Department of Defense (DOD) and the Department of the Army (DA), the creation of the center represented the only location in the United States to offer a comprehensive one-stop environmental training facility for government and private industry.[37]

Since its inception the center had experienced tremendous growth. During the first four years of its existence, it conducted classes in a small building along Currie Road. Early in January 1997, the center opened a state-of-the-art facility. It had ten classrooms, an auditorium with a seating capacity of four hundred, and an applied training laboratory. In the meantime, the center was redesignated the Center for Environmental Initiatives and Hands-on Training (CEIHOT) in 1994. CEIHOT offered resident and mobile training in 1997 as it had done in past years and taught 11,742 students during Fiscal Year 1997. Most of the training was compliance-driven. If individuals handled hazardous materials in any form, they required training.[38]

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[36]Memorandum for Command Historian, subj: Annual Historical Review, 22 Jan 98, Doc I-47; Memorandum for Cmd Historian, subj: 1997 USAFACFS Annual Command History, 19 Mar 98, Doc I-47A.

[37]1992 USAFACFS ACH, p. 32.

[38]1996 USAFACFS ACH, pp. 28-29; Memorandum for Command Historian, subj: Annual Command History-Directorate of Environmental Quality CY 1997, 10 Dec 97, Doc I-48.

CHAPTER TWO
LEADERSHIP DEVELOPMENT: TRAINING AND EDUCATION

INTRODUCTION

During 1997, Training Command continued efforts to train officers and soldiers to employ fire support systems. To accomplish this, the Command initiated work on Army values training in initial entry training, continued work on Classroom XXI and Distance Learning, revised Field Artillery Officer Advanced Course and Field Artillery Officer Basic Course, and provided new equipment training.[1]

ARMY VALUES TRAINING IN INITIAL ENTRY TRAINING

In 1997 the U.S. Army responded rapidly and positively to the sexual harassment scandals that had rocked advanced individual training at Aberdeen Proving Ground, Maryland. Taking the scandals seriously, the Chief of Staff of the Army, General Dennis J. Reimer, tasked the U.S. Army Training and Doctrine Command (TRADOC) in May 1997 to take a fresh look at how the Army conducted initial entry training (IET), which included basic combat training (BCT), one-station unit training (OSUT), and advanced individual training (AIT).[2] As General Reimer explained, the Army needed highly trained soldiers that embodied its values, ethics, and traditions.[3]

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[1]"Field Artillery Training Command," Field Artillery, Dec 97, p. 32, Doc II-1.

[2]Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97, Doc II-2.

[3]Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97; Memorandum for Record, subj: Information Obtained from COL

Subsequently, the Department of Army Inspector General (DAIG) and the Siegfried panel of September 1997 criticized TRADOC's initial entry training. Among other things, the DAIG and the Siegfried panel detected a lack of focus on Army values, traditions, and history and insufficient leader involvement in training. In light of the scandals, General Reimer, the DAIG, and the Siegfried panel agreed about the necessity of changing initial entry training by spending more time on the "soldierization process" but not by reducing the time spent on technical skills. Values had to be instilled the Army's soldiers in initial entry training that would be carried with them throughout their military career.[4]

Michael McKeeman, Cdr, Field Artillery Training Center, on 17 Dec 97, Doc II-2.

[4]Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97; Interview, Dastrup with COL Michael McKeeman, Cdr, Field Artillery Training, Fort Sill, 17 Dec 97, Doc II-4.

At a basic combat training/one station unit training conference in November 1997, TRADOC announced its proposed solutions in general terms, declared that the changes would be effective 1 October 1998, and pointed out that specifics would be forthcoming in February 1998. Besides recognizing the need to increase the technical quality of soldiers leaving the training base, TRADOC explained that training had to produce disciplined, team-oriented soldiers that embraced Army values and heritage. To produce such soldiers the Command planned to expand initial entry training by one week and to revise the program of instruction (POI) completely by including more training on values, heritage, and history and increasing the contact time that chain of command and drill sergeants had with the trainees. Initial entry training also had to be more challenging, rigorous, and team-work oriented.[5] Specifically, basic combat training would be increased from eight to nine weeks, and advanced individual training would be expanded a maximum of two days to accommodate the increased training on Army values, which was a top priority.[6]

Ultimately, restructuring initial entry training demanded more resources. At the November 1997 conference the commander of the Field Artillery Training Center at Fort Sill, Oklahoma, reminded TRADOC that "giving us a new mission without the resources only exacerbates the problem" already caused by shrinking resources, both monetary and personnel. In response, TRADOC assured the commander and other conference attendees that the resources would be available to execute the mission. As 1997 drew to a close, the commander of the training center awaited further guidance on the new initial entry training program of instruction and additional resources.[7]

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[5]Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97; Interview, Dastrup with McKeeman, 17 Dec 97.

[6]Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97; Msg, COL McKeeman to AC, USAFAS, subj: BCT Conference After Action Report (AAR), undated, Doc II-5.

[7]Msg, McKeeman to AC, subj: BCT Conference AAR, undated; Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97.

ARMY TRAINING XXI

The end of the Cold War with its attending budget and personnel reductions influenced the Army to revise its training strategy. Along with environmental concerns, resource constraints would limit the Army's ability to conduct large-scale, live field exercises in the future. In view of this projection about future constraints and the growing importance of worldwide contingency operations, the Army initiated Force XXI in the mid-1990s.[8] As a concept, Force XXI furnished the vision for transforming a force projection army, stationed in the continental United States (CONUS), to a capabilities- and task-based army in the 21st Century. As a Total Army concept that encompassed Active, Reserve, and Department of the Army civilian components, Force XXI provided a comprehensive approach to design the Army around information to be more versatile and flexible to achieve decisive victory across the spectrum of conflict.[9]

To ensure that training was included in every phase of Force XXI development, the U.S. Army Training and Doctrine Command (TRADOC) devised Army Training XXI to develop suitable training and to unite many ongoing efforts into a coherent plan to produce trained soldiers and combat ready units. The Combined Arms Training Strategy (CATS) outlined standardized training requirements and the resources necessary for institutional or unit training and supported Army Training XXI with subcomponents of Warfighter XXI for unit training, Warnet XXI for developing and acquiring new technology, and Warrior XXI for institutional training.[10]

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[8]1995 USAFACFS ACH, pp. 41-45, presents the initial discussion on Army Training XXI.

[9]1996 USAFACFS ACH, pp. 30-31; MG Leo J. Baxter, "Honing the Edge: State of the Field Artillery 1997," Field Artillery, Nov-Dec 97, pp. 1-6, Doc III-1.

[10]1996 USAFACFS ACH, p. 34. In 1996 COL White was the Director of WIDD that oversaw USAFAS's Army Training XXI effort and LTC Ellis was the Chief of Army Training XXI

Division of WIDD.

The Total Army School System (TASS) was a major Army Training XXI initiative in 1997 as it had been for several years. In response to the tasking from the Chief of Staff of the U.S. Army, General Gordon R. Sullivan, to develop a Total Army School System for the twenty-first century, the U.S. Army Training and Doctrine Command (TRADOC) organized Task Force Future Army Schools Twenty-One (FAST) under the Deputy Chief of Staff for Training early in 1992. Directed by the Commanding General of TRADOC, General Frederick M. Franks, Jr., Task Force FAST had the mission of establishing an effective and efficient Total Army School System of fully accredited and integrated Active Component (AC)/Reserve Component (RC) schools that furnished standardized individual training and education for the Total Army that would be taught to a single standard.[11] Looking to the future and expounding upon his guidance, General Franks explained, "America's Army needs a cohesive institutional training system that leverages available resources and investments currently in the Total Army School System. We need a Post Cold War Total Army School System across components. As we reduce the size of the components, we must also reduce our institutional training investments."[12]

TRADOC considered such a school system to be a major break with the past. Over the years, the AC, the Army National Guard (ARNG), and the U.S. Army Reserve (USAR) had developed independent school systems with separate standards. Downsizing the Army and the budget reductions made the three separate school systems uneconomical, inefficient, and anachronistic. By creating a single system and standard, Task Force FAST would abolish the system and simultaneously save money.[13]

In 1992-93 Task Force FAST organized TASS under the regional schools concept. The task force divided the continental United States (CONUS) into seven geographical regions. Each region had six colleges (brigades) to oversee instruction in leadership, officer education, health services, combat arms, combat support, and combat service support.

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[11]1996 USAFACFS ACH, pp. 35-36.

[12]1995 USAFACFS ACH, p. 46.

[13]Ibid.; 1996 USAFACFS ACH, p. 36.

Below the college-level the task force placed departments (school battalions). Each school battalion was aligned with an AC school and was responsible for instructing specific subjects within a particular career management field. For example, the U.S. Army Field Artillery School (USAFAS) was aligned with Field Artillery school battalions in each region.[14]

[14]Ibid., pp. 36-37.

Beginning in January 1993 and continuing into 1995, Task Force FAST organized a prototype school system in Region C to test the TASS concept and phased in the remainder of the regional schools by 1997. Composed of the states of North Carolina, South Carolina, Georgia, and Florida, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands, Region C had a regional coordinating element. The regional coordinating element established brigades and proponent-aligned battalions, utilizing the existing resources within the region, and worked to see that the region's school battalions were properly accredited. In 1996 USAFAS accredited the Region C Field Artillery school battalion to teach field artillery subjects. Accreditation permitted Field Artillery school battalions and training sites to teach USAFAS courses and use USAFAS-approved courseware. In 1997 the Field Artillery School conducted assessment visits to Region E (Michigan, Wisconsin, Minnesota, Illinois, Indiana, and Ohio), Region F (Nebraska, Iowa, Kansas, Missouri, Arkansas, Louisiana, Oklahoma, Texas, and New Mexico), and Region G (California, Arizona, Utah, Nevada, Idaho, Washington, Oregon, Montana, North Dakota, South Dakota, Wyoming, and Colorado). During the visits, School personnel determined their progress, provided guidance on using USAFAS courseware and courses, and announced their intention to return in the future for accreditation.[15]

After publishing a Field Artillery Technical Instructor Certification Program in 1995, USAFAS utilized it to certify instructors in 1995-97. Before assuming teaching duties, instructors had to demonstrate proficiency in the subject matter in each course that they taught and had to meet all other instructor requirements set forth by TRADOC Regulation 350-18 and TRADOC Regulation 351-10. By the end of 1997, the Field Artillery School had certified 842 instructors.[16]

One particular goal of TASS involved converting all instruction to Total Army Training System (TATS) courses. Through 1995 AC courses used by the RC were configured to fit the time, equipment, and facility constraints of the RC training environment. Only those tasks that were deemed important by the proponent to prepare reservists for mobilization were included in RC courses. Under TATS all critical tasks selected for AC training would be trained in the RC. In 1995-97 USAFAS converted twenty-six field artillery enlisted courses to TATS, which meant that AC and RC soldiers would be trained to the same standard. In 1997 the School, in addition, put four TATS courses and two Army Correspondence Courses for professional self-development on

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[15]1996 USAFACFS ACH, pp. 37-38; Interview, Dastrup with Sharon Dorrell, WIDD, 15 Jan 98, Doc II-6.

[16]1995 USAFACFS ACH, pp. 47-48; 1996 USAFACFS ACH, p. 38; Interview, Dastrup with Sharon Dorrell, WIDD, 15 Jan 98.

the Internet and planned to have all officer and enlisted courses on the Internet by the end of Fiscal Year 1998.[17]

DISTANCE LEARNING

[17]Interview, Dastrup with Dorrell, 15 Jan 98; Memorandum for Sharon Dorrell, WIDD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98, Doc II-7.

Following the end of the Cold War in 1990-91, Congressional funding cuts to the military services forced the Army to find innovative methods for training. Early in the 1990s, the Reserve Components (RC) -- U.S. Army Reserves (USAR) and Army National Guard (ARNG) -- still sent their soldiers to Active Component (AC) schools for training as well as depending upon their own schools for training. Because of budget cuts, the Reserve Components no longer had the money to send as many soldiers to Active Component schools for training. However, the Reserve Components still had to maintain quality training in the face of declining funding and also had to find a way of meeting their training needs. In the meantime, the U.S. Army Field Artillery School (USAFAS) and the U.S. Army Training and Doctrine Command (TRADOC) recognized that the Army would shrink in size and that the Army's reliance upon the Reserve Components would grow. In light of the projected restructuring in the near future, moreover, the Army National Guard would eventually have all of the Reserve Components' field artillery. Equally important, a decrease in funding and personnel would accompany the restructuring. Given the force projection requirements for the Army for contingency operations, the Total Army would require top quality training to execute its missions and be combat ready. This forecast of the future led to the Total Army Training Strategy (TATS) in which Reserve Component and Active Component soldiers would be trained to the same standard. Equally important, TATS gave the Active Component responsibility for furnishing quality standardized training to the Reserve Components. Ultimately, the Army planned to achieve training effectiveness and efficiencies for both the Active Component and the Reserve Components and simultaneously improve readiness in the face of a declining budget.[18]

[18]1996 USAFACFS ACH, pp. 42-43.

Out of this requirement to satisfy AC and RC training requirements, the employment of state-of-the-art technology to deliver training and distance learning emerged. Initially, the Field Artillery School envisioned employing correspondence courses, training support packages, and other exportable materials to train the Reserve Components. However, high technology offered a better way than the traditional methods of training did. Early in the 1990s, the Department of the Army introduced the Teletraining Network (TNET). Using a satellite, TNET had the ability of sending and receiving training courses via the air waves. If they had access to the TNET, soldiers could train at their home station. This would reduce expenditures and keep them in line with the declining budgets. In December 1992 the Field Artillery School acquired TNET capabilities and immediately employed them to provide the Staff Officer Refresher Course to the Reserve Components. Between 1992 and 1997, the School used TNET for Reserve Component instructor training, new equipment training for Active Component and Reserve Components, Advanced Field Artillery Tactical Data System sustainment training for the 1st Cavalry Division at Fort Hood, Texas, on-demand training, and video conferences.[19]

Based upon guidance from the Assistant Commandant and the Commandant of the Field Artillery School, in the meantime, the Directorate of Training and Evaluation (DTE), renamed Warfighter Integration and Development Directorate (WIDD) in 1995, developed a distance learning training strategy in 1994 that would save money and take training to the Reserve Components without compromising quality. Expanding its vision beyond the more traditional approach of providing distance learning to the Reserve Components, the School planned to use computer-based instruction (CBI), video tapes, video teletraining (VTT), simulations, CD-ROM, and TNET to standardize and distribute training to the Total Army, especially the Field Artillery.[20]

Approved in April 1996 by the Army Chief of Staff, the Army Distance Learning Plan (ADLP) furnished further distance learning guidance to TRADOC and USAFAS and simultaneously tied together various ongoing training initiatives for standardization purposes. Basically, the plan envisioned shifting from a predominately resident training environment to

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[19]1995 USAFACFS ACH, p. 51; Memorandum for Command History Program, subj: Input for 1997 Annual Command History, 7 Apr 98, Doc II-8; "Field Artillery Training Command," Field Artillery, Nov-Dec 97, p. 32, Doc II-8A. See AFATDS Distance Learning section in Chapter Two of 1997 USAFACFS ACH.

[20]1995 USAFACFS ACH, pp. 51-52; 1996 USAFACFS ACH, pp. 44-45; "Field Artillery Training Command," Field Artillery, Nov-Dec 97, p. 32.

a mix of distance learning, self-development, and resident training by delivering standardized individual training and portions of collective and self-development training to soldiers and units at the right place and right time via advanced technology.[21] Besides including existing distance learning efforts, the plan provided coherent direction and assigned responsibilities for a broad range of training options for soldiers, leaders, and units that best supported their needs. Concurrently, the plan addressed training standardization throughout the Total Army School System and identified training technologies, infrastructures, and time lines required to implement distance learning throughout the force.[22]

[21]Ibid., pp. 45-46.

[22]Ibid, p. 46.

As a critical piece of the Army Training XXI effort, the plan described seven types of distance learning facilities to be developed. They ranged from center and satellite distance learning facilities with a full training development capability to mobile sites with only transmitting and receiving capabilities. Of the seven different facilities, Fort Sill would be designated a center and have the full range of capabilities. In the near future 138 Total Army School System training battalions also would be equipped with distance learning classrooms. Each would have the capability of transmitting and receiving training and participating in interactive simulations. In the meantime, the National Guard intended to equip its armories with similar distance learning capabilities.[23]

Following the distribution of Army Distance Learning Plan, TRADOC tasked service school commandants in July 1996 to develop a supporting implementation plan. In a brief memorandum on 29 July 1996, the Commanding General of TRADOC, General William W. Hartzog, told commandants that they had to redesign courses to be consistent with the Total Army Training System, establish distance learning classrooms, and connect to a national information telecommunications infrastructure. From General Hartzog's perspective, the quality of training "must not change" but "the means and techniques must." The commandants had to incorporate video teletraining, computer-based instruction, CD ROM, Internet, and other advanced technologies into training techniques to make distance learning a reality. Ultimately, this meant abandoning training methods that dated back to World War II, that focused on resident training, that provided nonstandard training to the Reserve Components and Active Component, and that compartmentalized training into institutional, unit, and self-development training programs. Essentially, school commandants, including Major General Randall L. Rigby of the U.S. Army Field Artillery School, had to take the Army's way of training from "platform presence to video teletraining and simulation interactivity" and "from instructor-based to student-based training." As the Army explained, the Distance Learning Training Plan would be harmonious with existing training initiatives -- TASS, TATS, and Classroom XXI -- and

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[23]Ibid., pp. 46-47.

go beyond them. The plan would create "a wall-less classroom."[24]

[24]Ibid., pp. 47-48.

In response to TRADOC's tasking to write an operations plan to implement distance learning strategies, USAFAS completed one in October 1996 and sent it to TRADOC in November 1996. The plan detailed the process for development, execution, and management of distance learning programs for the Field Artillery and consolidated a group of existing plans. Besides announcing that all training would conform with TASS guidelines, the action plan outlined establishing modernized classrooms and providing a communications infrastructure as a part of Classroom XXI. The plan also projected converting all training to TATS; creating multimedia training materials; maintaining task performance standards across components; and developing, distributing, and maintaining collective training support packages for unit training. Also, the School would develop multimedia training modules for new equipment training that used distance learning facilities and equipment. Equally important, the School's plan was a living document to be updated and revised as required to meet changing conditions.[25]

Using the plan as a guide, USAFAS continued working on distance learning in 1997. During the year, USAFAS produced digitized lessons, interactive computer-based modules, and on-line training modules for Field Artillery MOSs. Specifically, the School completed 170 digital lessons for MOSs 13B (Cannon Crewmember), 13E (Cannon Fire Direction Specialist), and 13M (Multiple-Launch Rocket System [MLRS] Crewmember) that could be used for formal and refresher training and completed 185 digital lessons for MOS 13F (Fire Support Specialist) by mid-year and scheduled MOSs 13M (MLRS Crewmember), 13C (AFATDS Operation Specialist), 13P (MLRS Fire Direction Specialist), and 131A (warrant officer) for completion in Fiscal Year 1998. The lessons for MOS 13F, for example, were developed in forty-eight modules on eighteen CD-ROMs for formal and refresher training and could be ordered from the Army Training Support Center, Fort Eustis, Virginia. The lessons for each MOS contained video clips of instructors teaching, demonstrations on equipment, terrain features, and simulated exercises, while each module had a series of teaching objectives, practical exercises, and examinations and permitted student interaction at any point during the learning process. By the end of the year, the School also had converted twenty-six field artillery enlisted courses to TATS, put four TATS courses and two Army Correspondence courses for professional development on the Internet, and planned to have all officer and enlisted courses on the Internet by the end of Fiscal Year 1998. This effort moved the Field Artillery School farther along the path that would transform training from instructor-centered to student-centered, computer-generated training and simultaneously propelled the School

[25]Ibid., pp. 48-49; Memorandum for Cdr, TRADOC, subj: Distance Learning/Classroom XXI OPLAN, 6 Nov 97, Doc II-9.

further along from paper-based to multimedia module-based training.[26]

DIGITIZING FIELD ARTILLERY MANUALS

[26]"Field Artillery Training Command," Field Artillery, Nov-Dec 97, p. 32; "Technological Advances in Training," Field Artillery, Mar-Apr 97, p. 27, Doc II-10; Memorandum for Command Historian, subj: Training Development Products for WIDD, 7 Apr 98, Doc II-11; Interview, Dastrup with Dorrell, 15 Jan 98; Memorandum with Encls for Cdr, TRADOC, subj: Distance Learning/Classroom XXI OPLAN, 6 Nov 96, p. ES1.2.2.; Memorandum for Sharon Dorrell, WIDD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.

In 1997 digitizing Field Artillery manuals played a major role in the Classroom XXI effort. Beginning in mid-year, the Warfighting Integration and Development Directorate began digitizing training manuals in a multimedia format to be delivered on demand to any student with access to the World Wide Web. In addition, the directorate digitized unit mission training plans, field manuals, and special texts. All of the manuals could be scanned on line or downloaded onto a computer.[27]

CLASSROOM XXI

Backed with funding, the U.S. Army Training and Doctrine Command (TRADOC) launched its Classroom XXI initiative in 1995 to exploit high technology to improve classroom training. Initially, TRADOC tasked its service schools to explain how they would use the money to enhance training. Later in December 1995, TRADOC directed them to appoint a Classroom XXI point of contact and develop a Classroom XXI implementation plan during 1996. Although Training Command, U.S. Army Field Artillery Center and Fort Sill (USAFACFS), which consisted of the U.S. Army Field Artillery School (USAFAS), the Noncommissioned Officers Academy (NCOA), and the U.S. Army Field Artillery Training Center (USAFATC), was not sure how it planned to spend the money, it had ideas. In 1995 Training Command outlined expanding the use of distance learning, integrating USAFAS with other TRADOC schools, expanding the use of multimedia courseware, bringing simulations into the classroom, employing the Internet, and upgrading training in general.[28]

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[27]Interview, Dastrup with Tom Carr, Integration Division, WIDD, 21 Jan 98, Doc II-12; "Technological Advances in Training," Field Artillery, Mar-Apr 97, p. 27, Doc II-13.

[28]1996 USAFACFS ACH, pp. 49-50.

In 1995 Training Command's concept for Classroom XXI consisted of five major elements. A TRADOC term, Campus Area Network (CAN) would connect the various USAFAS buildings into one communications network, while the Local Area Network (LAN), a Training Command concept, would be the communication technology inside the buildings. The CAN and LAN formed the backbone of Classroom XXI, while simulation-enhanced instruction classrooms to permit greater use of simulations, multimedia-enhanced instruction classrooms to furnish more effective and varied training, and computer-enhanced instruction classrooms would provide the trimmings. Training Command planned to convert existing classrooms in Snow Hall to simulation-enhanced instruction classrooms and multimedia-enhanced instruction classrooms in Fiscal Year (FY) 1996 but would not introduce computer-enhanced instruction classrooms until FY 1997 because the School was still developing the instruction.[29]

In 1996 and 1997 Training Command leveraged technology to meet Classroom XXI guidelines, to enhance resident instruction, and to support the Total Army School System (TASS). Using a fiber optics CAN, it tied Knox Hall, I-See-O Hall, Snow Hall, Searby Hall, Summerall Hall, and Burleson Hall (all were part of the USAFAS campus) into one communications network, completed LANs in each respective building, and implemented the Internet link in 1996.[30]

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[29]Ibid., pp. 50-51.

[30]Ibid., p. 51. Note: Training Command's CAN address book included the Noncommissioned Officers Academy and U.S. Army Field Artillery Training Center for the first time in 1997.

As work proceeded with the CAN and LAN, Training Command developed a Classroom XXI implementation plan late in 1996 as directed by TRADOC and set it in motion. Basically, the plan continued the initiatives started in 1995-96 and refined them. By 1997 Training Command had eleven level-one classrooms with multimedia overheads, access to the LAN, video recorders, large-screen televisions, and instructor computer work stations; one level-two classroom with computer-based instruction capabilities using CD ROM, LAN connections, and access to the World Wide Web; two level-three classrooms with multimedia computers and video teletraining capabilities with two-way audio-video possible between Fort Sill and remote training sites; and two level-four classrooms with the Janus simulation system and the ability to send and receive simulated training exercises. During 1997, Training Command also expanded the number of buildings on the CAN and LAN to ATC and NCOA, created more computer-enhanced classrooms, and connected ATC and NCOA to the television network (TNET), the simulation center, and the Internet.[31] This modernization effort permitted students to use simulations, interactive software, and other automated capabilities as a vital portion of their learning experience. As of 1997, classroom modernization enhanced training by permitting material to be presented in an efficient multimedia format, helped students acquire an appreciation of simulation enhanced training, and reinforced classroom instruction. Also, the fiber optics networks, the Internet, CD-ROM, and other technologies provided Training Command with worldwide access to digital information, training, and simulations.[32]

In October 1997 the Field Artillery School signed a memorandum of agreement to bring one Digital Training Access Center on line, to install three Distance Learning classrooms, and to install two level one and one level three classrooms.

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[31]Ibid., pp. 52-53.

[32]Ibid., pp. 51-52; "Technological Advances in Training," Field Artillery, Mar-Apr 97, p. 27, Doc II-14; Msg, subj: Input for Classroom XXI History, 13 Feb 98, Doc II-15.

The Digitized Training Access Center would electronically store and distribute the digital proponent record copy of approved training materials. Classroom XXI would support institutional resident training and serve as a platform to export resident training to distance learning facilities, while Distance Learning Classrooms would provide level three support and deliver training to Active Component and Reserve Component soldiers and civilians that had access to distance learning facilities.[33]

FIELD ARTILLERY OFFICER BASIC COURSE RESTRUCTURE

[33]Memorandum (Extract) for Director, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97, Doc II-16.

Influenced by the declining budget and the high attrition rate, the Assistant Commandant of the U.S. Army Field Artillery School (USAFAS), Brigadier General William J. Lennox, Jr., in 1996 directed the Field Artillery Officer Basic Course (FAOBC) to be revised for the fourth time in four years. As it existed in 1996, FAOBC consisted of three phases. Lasting the first seven weeks, the first phase focused on platoon leader skills and had two field training exercises -- Smell Cordite and Rolling Thunder. In phase two (the eighth through thirteenth week) the students received training in basic gunnery (manual and automated) and basic fire support and underwent one field training exercise -- Battle King. During phase three (fourteenth through twentieth week), the School taught more gunnery and fire support and conducted a field training exercise -- the Redleg War. Although this produced qualified Field Artillery second lieutenants, General Lennox wanted FAOBC to focus on fire support officer skills, fire direction officer skills, and platoon leader skills. At the same time the General wanted to increase the level of training achieved by graduating FAOBC students without increasing the length of the course. He also desired to replace the requirement for follow-on courses on the Multiple-Launch Rocket System (MLRS) and the Paladin M109A6 self-propelled 155-mm. howitzer with a track system that prepared officers for duty with light artillery units, heavy artillery units, or MLRS units.[34]

To improve the quality of FAOBC graduates and to reduce attrition, the School with the Gunnery Department taking the lead modularized the course in 1996 and tied it to a mentoring program to take advantage of experienced leaders who could help new second lieutenants make the transition to army life. Although it retained the three phases, the School divided the course into four major modules (fire direction officer, fire support officer, platoon leader, and common core), subdivided them into smaller modules, and reduced the number of field training exercises from four to two. Students had to pass each module examination with at least a seventy percent. If the student failed to maintain a seventy percent grade point average or if the student reached a point where the person could not attain a seventy percent grade point average, the School could recycle the individual into a following FAOBC to give the individual another opportunity to learn the material and pass the module examination.[35]

Rather than doing this, the School developed a floating

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[34]1996 USAFACFS ACH, pp. 53-54. In 1996 the Field Artillery School revised FAOBC for the fourth consecutive year. See previous USAFACFS Annual Command Histories for additional information.

[35]Ibid., pp. 54-55; "Field Artillery Training Command," Field Artillery, Nov-Dec 97, p. 32, Doc II-1.

module for failing students to receive additional training from a pool of instructors, knowing that it had advantages and disadvantages. On the negative side the School projected that the floating module would be time consuming, would be labor intensive, and would create a heavy workload on instructors and students because the latter still had to complete their regular class load. Even so, the floating module held out the hope of reducing the number of students being recycled and halting the upward spiral in the attrition rate. Along with the module system as a whole, the floating module reduced the attrition rate by providing remedial individualized instruction with a small instructor-to-student ration that led to higher pass rates on retests.[36]

[36]1996 USAFACFS ACH, p. 55; Memorandum for Record, subj: OBC Revisions, 18 Feb 98, Doc II-17.

To abolish the requirement for students to attend a follow-on course for the MLRS or the Paladin, the School developed three tracks. During the last week of FAOBC, students would attend the MLRS, the Paladin, or the light artillery track, depending upon their first assignment after graduation. This step integrated MLRS and Paladin training into the FAOBC program of instruction and saved money at the same time. Along with the modular concept, the three tracks produced a significantly restructured FAOBC.[37]

Instructor shortages soon forced the Field Artillery School to modify the above curriculum within months after it had been introduced early in 1997. Under the recently adopted format fire support and gunnery instruction ran parallel to each other. Over a period of about thirteen weeks, half of FAOBC took gunnery in the mornings, and half took fire support in the mornings. In the afternoons they switched. This gave students four hours of gunnery and four hours of fire support instruction during the day and permitted the students to see how the two subjects were interrelated. During the thirteen weeks, the students also received instruction in other subjects. After serious consideration the Gunnery Department created an eight-week block of instruction for gunnery and fire support instruction and started it in mid-1997. While one half of the class took fire support, the other half worked on gunnery. At the end of eight weeks, they switched.[38]

The new format had serious consequences and forced changes. Besides an overall drop in student grades, the intensive gunnery instruction burned out the students and instructors because it lasted for eight hours a day for eight weeks. Equally important, students had difficulties understanding how fire support and gunnery related to each other because the instruction on the two did not run concurrently as it once had done and offer opportunities to

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[37]1996 USAFACFS ACH, pp. 55-56; Interview, Dastrup with COL J.K. Anderson, Dir, GD, 16 Dec 97, Doc II-18.

[38]Interview, Dastrup with MAJ D.A. Vindich, Chief, Officer Instruction Branch, GD, 27 Jan 98, Doc II-19; Interview, Dastrup with COL J.K. Anderson, Dir, GD, 16 Dec 97.

see how gunnery and fire support fit together. In view of the problems, the Gunnery Department reinstituted the original format late in 1997. One half of the FAOBC class took gunnery in the mornings, and the other half took fire support in the morning. In the afternoons they switched. The format not only reduced student burnout but also reinforced the relationship between fire support and gunnery because students could see how they were connected.[39]

[39]Interview, Dastrup with Vindich, 27 Jan 98.

In the meantime, a Field Artillery School video teleconference in November 1996 with Combat Training Center personnel and field commanders revealed deficiencies in light force training for second lieutenants that led to changes in FAOBC. As the conference indicated, second lieutenants had difficulties conducting land navigation, determining target location, and using indirect fires in restrictive terrain. In response to the needs highlighted by the teleconference, the Basic Fire Support Branch and the Combined Arms Division in the Fire Support and Combined Arms Operations Department (FSACOD) introduced the Lightfighter Fire Coordination Exercise (later renamed the Dismounted Fire Support Officer Fire Coordination Exercise) in June 1997 to expose future company fire support officers to the intricacies of fire support in the light forces.[40]

As of mid-1997, the four-hour Dismounted Fire Support Officer Fire Coordination Exercise followed classroom instruction that addressed the deficiencies and other light fighter tasks and permitted FAOBC students to apply their course knowledge. Prior to the exercise, the instructors briefed the students on an operations order that was based upon an air assault task force conducting a deliberate attack of an isolated enemy company position. Although the air assault was notional, students developed their initial plan for fires. The day prior to the exercise, students conducted a leader's reconnaissance of the area of operations, finalized their plans, and conducted task force rehearsals. On the day of the actual exercise, students assumed the roles of three company fire support headquarters and their respective observer parties. Upon arrival at the landing zone, the students carried out pre-combat checks and a radio rehearsal of their fire plans and then implemented them. From the line of departure, the students navigated a 3.5 kilometer lane while being attacked and engaging the enemy with indirect fires. Once the objective had been secured, the students developed a quick-fire plan based on an enemy counterattack

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[40]"Lightfighter FCE Coming to FAOBC," Field Artillery, May-Jun 97, p. 29, Doc II-20; Information Paper, subj: Dismounted Fire Support Officer Coordination Exercise, 18 Aug 97, Doc II-21; Interview, Dastrup with MAJ Grant H. Thomas, FSCAOD, 30 Jan 98, Doc II-22.

and then participated in a detailed after action review.[41]

[41]"Lightfighter FCE Coming to FAOBC," p. 29.

After two iterations of the exercise, the FSCAOD enhanced it in the fall of 1997. The Department revamped a four-hour block of instruction that had been dedicated to Janus simulation training into a three-station exercise. Each station provided critical training and rehearsals that would enhance the actual exercise. The Dismounted Fire Support Officer Fire Coordination Exercise usually occurred the day after the leader's reconnaissance. During the exercise, which had been expanded from four to eight hours, FAOBC students finalized and briefed their plans based upon their rehearsals and company-level planning, implemented them, and participated in an after action review. In addition, XVIII Airborne Corps units and the Joint Readiness Training Center provided observer/controller support for each class. As the Director of the Fire Support and Combined Arms Operations Department explained, the exercise replicated the stresses and challenges of providing fire support in a light force environment.[42]

CAPTAIN PROFESSIONAL MILITARY EDUCATION

Desiring to improve officer professional military education so that it developed innovative leaders for Force XXI, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC), General William W. Hartzog, directed the Officer Advanced Course (OAC) at the various TRADOC service schools and the Combined Arms Services Staff School (CAS3) at Fort Leavenworth, Kansas, to be revamped. In October 1994 he tasked the Deputy Commandant of the U.S. Army Command and General Staff College (CGSC) to review ways to gain efficiencies in Captain Professional Military Education (CPT PME). Based on the CGSC study of 1990-91 and the subsequent work of the TRADOC Reengineering Study of 1993-94, the Deputy Commandant and the Command and General Staff College developed a concept of merging OAC and CAS3 into a twenty-week course that would be preceded by a non-resident phase. This study then formed the basis of the 1995-96 TRADOC Deputy Chief of Staff Training CPT PME Study that was conducted in conjunction with the branch service schools. The CPT PME study recommended improving the synchronization of training with assignments to eliminate disruption to units and concurrently advocated abandoning the existing two-course CPT

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[42]Interview, Dastrup with MAJ Grant H. Thomas, Chief, Basic Fire Support Branch, Fire Support Division, FSCAOD, 30 Jan 98; Information Paper, subj: Dismounted Fire Support Officer Fire Coordination Exercise, 18 Aug 97; Fact Sheet, subj: Dismounted Fire Support Officer Fire Control Exercise, 30 Jan 98, Doc II-23; Memorandum for MAJ Grant Thomas, FSCAOD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98, Doc II-24; Memorandum for Director, FSCAOD, subj: 1997 USAFACFS Annual Command History, 18 Mar 98, Doc II-25; Interview, Dastrup with COL L.G. Swartz, Dir, FSCAOD, 16 Dec 97, Doc II-26.

PME that was composed of OAC and CAS3 for a single captain's career course.[43]

[43]Memorandum for See Distribution with Encl, subj: CPT PME Action Plan, 7 Aug 97, Doc II-27.

Understanding the need to revamp professional education for captains, General Hartzog endorsed the CPT PME study and desired that all captains would eventually receive their professional education at one location. Because the General recognized that getting there would be a challenge, he embraced the study's four-phase approach to transition from a two-course to a single-course CPT PME and gained approval from the Chief of Staff of the Army on 27 July 1996 to take such action.[44] Phase one would maintain the status quo. This meant that officers would have one or two operational assignments after OAC before attending the nine-week CAS3 on a temporary duty basis. While phase two delineated retaining the twenty-week OAC, it also outlined developing a six-week CAS3 program of instruction (POI) that would be synchronized with OAC by aligning its start dates with OAC end dates and would be implemented between Fiscal Year (FY) 1997 and FY 1999. According to this plan, captains would attend CAS3 immediately after graduating from OAC with an entire OAC class attending the same CAS3. During phase three, a single, three-phase captain career course would be created, would be initiated in FY 1999, and would employ distributive education for common core and other appropriate subjects. Phase four would exploit technology and would be concurrent with phase three. Equally important, General Hartzog's "glide path" would permit keeping the best aspects of the current system if technology proved to be too expensive or incapable of replicating the personal interaction that was fundamental to leader development.[45]

Only phase two directly influenced the U.S. Army Field Artillery School (USAFAS) in 1996. Because Fort Leavenworth planned to have seven CAS3s in FY 1997 and because General Hartzog ideally wanted OAC graduates to flow directly into a CAS3 class by synchronizing OAC end dates with CAS3 start dates, USAFAS examined its FY 1996 and FY 1997 OAC schedules. To preclude dramatic rescheduling, the School noted that its current OAC schedule could be retained and feed into some CAS3 classes. For example, OAC 1-97 graduated on 28 March 1997, and CAS3 4-97 started on 9 April 1997. Also, OAC 2-97 ended

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[44]Ibid.

[45]1996 USAFACFS ACH, pp. 56-57; Memorandum for See Distribution with Encl, subj: CPT PME Action Plan, 7 Aug 97.

on 20 June 1997, and CAS3 began on 29 July 1997.[46]

[46]1996 USAFACFS ACH, pp. 57-58.

Early in February 1996, the School offered another alternative to meet the intent of the General's guidance. It could increase the number of OACs per fiscal year from four to seven and align them to match up with CAS3 classes. For example, OAC 3-96, the first class under the new system, reported on 28 May 1996 and ended on 18 October 1996. Subsequently, CAS3 1-97 began in 22 October 1996. Thus, at the beginning of 1996, two viable options existed to align OAC with CAS3. One preserved the existing schedule of four OAC classes per year and would make fewer demands on school resources, while the other provided seven OAC classes and would strain USAFAS resources.[47]

Although USAFAS expressed concerns in February 1996 about the scheduling, personnel, and equipment costs associated with implementing phase two, TRADOC pressed forward executing the Commanding General's directions. In August 1996 TRADOC reaffirmed that officers should move directly from OAC to CAS3 so that an entire OAC graduating class would attend the same CAS3, even though exceptions existed. "If a branch career path calls for an officer to proceed from an OAC to a follow-on specialty or functional course, synchronization should be based on CAS3 attendance after the follow-on course," TRADOC explained.[48] By taking this position TRADOC recognized the Field Artillery School's concern about the necessity of follow-on courses and the difficulty of scheduling an entire OAC into one CAS3.[49]

At the end of 1996, USAFAS indicated that phases one and two had been implemented and that phases three and four were being planned in greater detail than previously. In October 1996 USAFAS began conducting seven courses each year and linked them with CAS3. Simultaneously, the U.S. Army Command and General Staff College reduced CAS3 from a nine-week to a six-week course by eliminating approximately ninety hours of training. As of 1996, phase three essentially would synchronize the common core subjects required by TRADOC, the Field Artillery OAC POI, and the CAS3 POI into an integrated

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[47]Ibid., p. 58.

[48]Ibid., p. 59.

[49]1996 USAFACFS ACH, p. 59.

career course. The course would be broken into two weeks of common core, sixteen weeks of fire support and field artillery subjects, and six weeks of CAS3. The major impact on USAFAS would be reducing OAC from twenty weeks to eighteen weeks to train officers on the critical tasks required for battery command, fire support officer, and staff duties at battalion and brigade level.[50]

[50]Ibid., pp. 59-60; Briefing, subj: CPT PME, 30 Jan 98, Doc II-28.

Phase four represented the culmination of the captain career course. Besides integrating Distance Learning, Classroom XXI, and Centers and Satellites initiatives into the captain career course, the phase planned for the course to be taught at one location and to employ advanced information technologies to permit interaction between USAFAS instructors and CAS3 instructors.[51]

In 1997 TRADOC solidified its plans for phases three and four. As announced in August 1997, phase three would consist of three parts and begin in FY 1999. After making a permanent change of station (PCS) to a branch school, captains would undergo two weeks of common core instruction during part one. Branch tactical, technical, and warfighting instruction would follow in part two at the branch school. Together, parts one and two meant spending approximately eighteen weeks at the branch school. For part three the officers would move in a temporary duty (TDY) status enroute to a new assignment or TDY return status to the branch school for staff process training at Fort Leavenworth for six weeks. In phase four that was scheduled to begin in FY 2002, captains would attend a Consolidated Captains Career Course at a branch school. The course would be broken down into three parts. Part one would last two weeks and provide common core instruction, while part two would take sixteen weeks and furnish branch technical, tactical, and warfighting skills. Using distance learning technology, part three would be beamed from Fort Leavenworth to the branch schools, would last six weeks, and cover staff processes.[52]

Moving from phase two to three involved hard work in 1997 for the Field Artillery School. The School initiated action on synchronizing OAC and CAS3 programs of instruction to eliminate redundancies, redesigned its POI as Total Army Training System Courseware, and continued Classroom XXI

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[51]1996 USAFACFS ACH, p. 60.

[52]Memorandum for See Distribution with Encl, subj: CPT PME Action Plan, 7 Aug 97; Briefing, subj: CPT PME, 30 Jan 98.

modernization. At the same time the School restructured OAC by reducing it from twenty to eighteen weeks. At the end of the year, the School awaited the common core training support packages from TRADOC. Without receiving the packages by February 1998, the School explained to TRADOC that meeting the 1 October 1998 start date for phase three would be impossible.[53]

FIELD ARTILLERY PRECOMMAND COURSE

[53]Ibid.; Draft POI, Doc II-29; Memorandum for Record, subj: Executive Summary of CPT PME Council of Colonels, 17 Nov 97, 12 Jan 98, Doc II-30; Memorandum for Record, subj: Executive Summary for CPT PME General Officer Steering Committee VTC, 30 Jan 98, 12 Jan 98, Doc II-31.

In 1997 the Fire Support and Combined Arms Operations Department (FSCAOD) in the U.S. Army Field Artillery School added several new and innovative classes to the Precommand Course for new field artillery battalion and brigade commanders. FSCAOD adopted video teleconferences with maneuver brigade and battalion commanders to discuss fire support issues that were pertinent to precommand students and placed a special emphasis on recent combat training center performances and expectations that maneuver commanders had for fire support. Also, these discussions covered command philosophies, and tactics, techniques, and procedures. Additionally, a working lunch was started with Field Artillery Officer Advanced Course students who had served in the units that the precommand students would be commanding to give them a perspective on the unit. In addition, FSCAOD incorporated a three-phase program to train students how to deal with the media and introduced a stress management program that was scheduled to begin in February 1998.[54]

ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM DISTANCE LEARNING

As of August 1997, few senior noncommissioned officers and officers of the 1st Cavalry Division artillery at Fort Hood, Texas, had experience with the Advanced Field Artillery Tactical Data System (AFATDS) because the unit had lost most of its personnel trained during new equipment fielding and had received untrained AFATDS personnel to replace them. Unfortunately, these leaders' schedules prohibited attending the AFATDS Leader's Course at Fort Sill, Oklahoma. In view of the situation, the Fire Support and Combined Arms Operations Department (FSCAOD), U.S. Army Field Artillery School (USAFAS), assisted the division by providing input to an

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[54]Fact Sheet, subj: Field Artillery Pre-Command Course, undated, Doc II-32; Interview, Dastrup with LTC M.T. Dooley, Dep Dir, FSCAOD, 15 Jan 98, Doc II-33.

AFATDS leaders' course for senior noncommissioned officers and officers through distance learning to train them how to understand the basics of the AFATDS system. Taught during the fall of 1997, the course integrated video teleconferencing and study packets and covered instruction on the basic operations of AFATDS with a focus on troubleshooting, system functionality, and critical supervisory areas.[55]

[55]Interview, Dastrup with CPT Chris Reynolds, Chief, Fire Support Automation Branch, Command and Control Division, FSCAOD, 13 Feb 98, Doc II-34; Memorandum for USAFAS, subj: AFATDS Distance Learning Course Requirements, 22 Aug 97, Doc II-35; Memorandum for Red Team 6, subj; Suggestions for AFATDS Distance Learning Courses, 5 Aug 97, Doc II-36; Memorandum for 1st Cavalry Divarty and USAFAS, FSCAOD, subj: AFATDS Leaders' Course and Distance Learning, 12 Nov 97, Doc II-37; Msg, subj: AFATDS Distance Learning, 19 Feb 98, Doc II-38.

Teaching the course challenged the Fire Support Automation Branch, Command, Control, and Communications Division, FSCAOD. Because the Teletraining Network (TNET) could not be linked with AFATDS digitally so that the AFATDS screen could be sent electronically and projected on a large screen at the 1st Cavalry's training facilities, the Fire Support Automation Branch had to use a television camera. They videotaped the AFATDS demonstration at Fort Sill, used a taped demonstration rather than a live one, and showed the tape on a large screen at the 1st Cavalry's training facilities. Although the instruction over TNET worked, Fire Support Automation Branch instructors could not see the student screens. This limited their ability to assist the students if problems arose. Notwithstanding this restriction, AFATDS distance learning demonstrated promise. The course highlighted distance learning's ability to send instruction to sites with appropriate equipment.[56]

NEW EQUIPMENT TRAINING

Multiple-Launch Rocket System (MLRS) Training

As early as 1991, the Army's worldwide contingency strategy mandated deploying, fighting, and winning even though the Active Component (AC) force structure was shrinking. This placed a greater reliance upon the Reserve Components (RC) -- U.S. Army Reserve (USAR) and U.S. Army National Guard (ARNG)

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[56]Msg, subj: AFATDS Distance Learning, 19 Feb 98; Interview, Dastrup with Reynolds, 13 Feb 98; Memorandum for Record, subj; Video Teletraining, 13 Feb 98; Msg, subj: AFATDS Distance Learning Training, 12 Jan 98, Doc II-39; Msg, subj: Distant Learning with 1st Cavalry, 3 Nov 97, Doc II-40.

-- to augment the Active Component than previously. In view of this situation, the success of 1-158th Field Artillery Regiment (MLRS) of the Oklahoma Army National Guard in Operation Desert Storm in Southwest Asia in 1991 and the need to remove the obsolete 8-inch self-propelled howitzer from the inventory, the Army developed a transition program. It involved converting National Guard field artillery units from the 8-inch self-propelled howitzer to the MLRS.[57]

[57]1994 USAFACFS ACH, p. 57; 1995 USAFACFS ACH, p. 69.

Early in the 1990s, the Gunnery Department in the U.S. Army Field Artillery School (USAFAS) designed a four-phase MLRS training strategy to move an Army National Guard battery from individual qualification through battery certification. The strategy permitted sufficient latitude within each phase to tailor the training to the specific requirements of the unit. During phase one, National Guard soldiers underwent common core skill training in communications, map reading, and drivers training at their home station. Phase one established the foundation for all future training, had to be completed before the soldiers went to Fort Sill for Military Occupational Skill (MOS) training by New Equipment Training Detachment (NETD) instructors, and by 1997 used Fort Sill's Televised Network Training (TNET) to conduct a portion of the training at the home station. During phase two, soldiers attended MOS 13M (MLRS Crewman) and MOS 13P (MLRS Fire Direction Specialist) course training or the shortened version of the regular MLRS Cadre course. The Gunnery Department designed phase two to be conducted during the National Guard's two-week annual training time with the exception of MOS 13P, which lasted three weeks. Upon completion of the courses, the soldiers received their new MOSs.[58]

The next two phases entailed collective training. Phase three consisted of section- platoon-, and battery-level training during two years of weekend drills and annual training at a local training area or a nearby army post. For NETD personnel, phase three meant a two-year permanent change of station because they were sent to the National Guard unit's home station to conduct the training. Held during the third annual training period, phase four or the final phase evaluated battery-level training and was conducted by the battalion's higher headquarters with assistance from a U.S. Army Forces Command unit.[59]

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[58]1996 USAFACFS ACH, pp. 61-62; Fact Sheet, subj: MLRS NETDs, 15 Nov 97, Doc II-41.

[59]1996 USAFACFS ACH, p. 62; Fact Sheet, subj: MLRS NETDs, 15 Nov 97; Interview, Dastrup with MAJ Jonathan Brooks, New Equipment Training Branch, GD, 11 Feb 98, Doc II-42.

Between 1991 and 1995, the Gunnery Department employed the four-phase training program to train National Guard units. During those years, it trained the 1-171st Field Artillery (FA) of the Oklahoma/Texas Army National Guard and the 1-182nd Field Artillery of the Michigan Army National Guard.[60]

[60]1995 USAFACFS ACH, pp. 70-71.

As training was concluding for the Michigan National Guard, MLRS transition training for the 1-181st Field Artillery of the Tennessee Army National Guard and 1-623rd Field Artillery of the Kentucky Army National Guard began. Phase one training started in October 1993, and phase two training ended in 1994. During annual training in 1995, the 1-181st Field Artillery went through phase three collective training. Subsequently, the unit completed the second year of phase three collective training and phase four battery certification in 1996. Concurrently, the 1-623rd Field Artillery underwent the first three phases of conversion training in 1994-96 and completed battery certification training in the summer of 1996.[61]

In the meantime, transition training for other National Guard units started in 1996. In August 1996 the Gunnery Department deployed a NETD to Florida to start phase two training for the 3-116th Field Artillery of the Florida Army National Guard and completed the phase in June 1997 with battery certification in phase four scheduled to be conducted during annual training in 1998. Unlike previous NETDs, this one consisted of AC and RC personnel with the express purpose of getting the latter qualified to be instructors in all MLRS courses. In the fall of 1996, phase one training began for the 2-130th Field Artillery of the Kansas Army National Guard and the 3-178th Field Artillery of the South Carolina Army National Guard. While phase two training was completed in the summer of 1997, the Gunnery Department sent NETD teams to Fort Riley, Kansas, and Fort Jackson, South Carolina, in October 1997 to begin phase three training. Subsequently, 2-147th Field Artillery of the South Dakota Army National Guard and 1-142nd Field Artillery of the Arkansas Army National Guard started phase one training late in 1997.[62]

In cooperation with the Gunnery Department, the 1-142nd Field Artillery conducted an alternative NET plan to accelerate training to put them on the same timeline as the Kansas and South Carolina National Guard units. During 1997,

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[61]1995 USAFACFS ACH, pp. 71-72; 1996 USAFACFS ACH, p. 63.

[62]Ibid., pp. 63-64; Fact Sheet, subj: MLRS NETDs, 15 Nov 97; Interview, Dastrup with Brooks, 11 Feb 98.

the Gunnery Department dispatched instructors to Fort Chaffee, Arkansas, on weekends and during annual training periods to train instructors during phase three. To do this, the Department had to rely upon internal personnel resources because budget restraints prevented TRADOC from providing them as it had done in the past[63].

Paladin M109A6 Self-propelled 155-mm. Howitzer Training

[63]Fact Sheet, subj: MLRS NETDs, 15 Nov 97; Interview, Dastrup with Brooks, 11 Feb 98.

During 1995, the Paladin Division, Gunnery Department, U.S. Army Field Artillery School (USAFAS) conducted new equipment training on the Paladin, using a new equipment training (NET) team. The team trained the 3rd Armored Cavalry Regiment (ACR) at Fort Bliss, Texas; the 1/3 Field Artillery, 2nd Armored Division, Fort Hood, Texas; and observer controllers at the National Training Center, Fort Irwin, California. However, the drawdown and budget reduction had a significant influence upon the training. In previous years a new equipment training team had fifty-four people and trained the entire battalion at one time. In 1995 the drawdown and budget cuts reduced the team to twenty-six people and changed the instructor-student ratio from one to three to one to six. This forced the Gunnery Department to revamp its training by devising a six-week training schedule. Rather than teaching an entire battalion at one time, the team conducted organizational and direct support maintenance training for the mechanics during the first two weeks. In the third week the team provided operator training for the leaders; and in the fourth week they trained the operators. During the last two weeks of training, the NET team conducted collective training and concluded it with intensive battery field exercises and battery and battalion dry- and live-fire exercises.[64]

In 1996 the Gunnery Department's NET team continued training units being equipped with the Paladin, using the same training plan that had been developed in 1995. In 1996 the NET team trained the 1/82 FA, 2/82 FA, and 3/82 FA, 1st Cavalry Division, Fort Hood; the 3/29 FA, 4th Infantry Division, Fort Carson, Colorado; and the 3/16 FA, 4th Infantry Division, Fort Hood.[65]

The following year, Paladin conversion training continued. During the year, the NET team trained the 1/17 FA, III Armored Corps Artillery at Fort Sill, Oklahoma; 3/18 FA, III Armored Corps Artillery; 1/37 FA, Camp Stanley, Korea; 1/15 FA, Camp Casey, Korea; and 2/17 FA, Camp Hovey, Korea. The team also conducted Army National Guard assistance visits to 1/127 FA, Fort Riley, Kansas; and 1/214 FA, Fort Stewart,

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[64]1996 USAFACFS ACH, pp. 64-65.

[65]Ibid., p. 65.

Georgia.[66]

[66]Fact Sheet, subj: Division Accomplishments, 16 Dec 97, Doc II-43; Memorandum for Cdr,, 1/37 FA, subj: Paladin NET Final Report - 1st Battalion, 37 FA, 25 Nov 97, Doc II-44.

However, funding reductions in 1997 compelled the Gunnery Department to modify the Paladin training once again. By reducing the time spent in the field, the Department curtailed training to four weeks and divided it into two phases. In phase one the NET team conducted training for organizational and direct support maintenance personnel. In phase two the team trained the leaders and the soldiers in military occupational specialties (MOS) 13B (Cannon Crewmember), 13E (Cannon Fire Direction Specialist), 13C (Communication Operations Specialist), and 13F (Fire Support Specialist). The NET team completed phase two with a battery dry fire exercise and a battery and battalion live fire exercise.[67]

Recognizing that training the Army National Guard field artillery battalions would be labor intensive and challenging, the Army turned to the National Guard Bureau for assistance. To facilitate National Guard fieldings that would begin in 1997 and continue through 2001, the National Guard Bureau announced the creation of thirty Title 10 Active Guard Reserve (AGR) positions for the M109A6 Paladin NET team on 15 August 1996. The Bureau wanted three officers and twenty-six noncommissioned officers to serve as instructor-writers and to become subject matter experts, who could be used by their respective states after their tour on the NET team had been completed. Once on board in 1997, the National Guard NET team gave the Field Artillery School a second NET team. However, in keeping with the Total Force concept, National Guard personnel were integrated with active component people on 1 January 1998. Two Paladin NET teams still existed, but they were composed of National Guard and active component personnel with no distinction being made between the two components.[68]

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[67]Interview, Dastrup with CPT Mark Strong, Paladin NET Team, GD, 28 Jan 98, Doc II-45; Memorandum for Cdr, 1/37 FA, subj: Paladin NET Final Report - 1st Battalion, 37th Field Artillery, 25 Nov 97.

[68]Interview, Dastrup with CPT Mark Strong, Paladin NET Team, GD, 26 Jan 98, Doc II-45A; Memorandum for Adjutants

DIVISION ARTILLERY STAFF TRAINER

Generals of All States, Puerto Rico, Virgin Islands, Guam, and the District of Columbia, subj: Active Guard Reserve Authorizations and Controlled Grades for Paladin, 1 Mar 97, Doc II-46; "Redlegs Need for ARNG Paladin NET," Field Artillery, Jan-Feb 97, Doc II-47.

In 1996 the Unit Training Division, Warfighting Integration and Development Directorate (WIDD), U.S. Army Field Artillery School (USAFAS) pointed out that the future battlefield would be different from current battlefields. Modern weaponry, brilliant munitions, and the high cost of fielding large armies would create widely dispersed battlefields. Operations would be more fast paced and more lethal than in the 1990s, while vast amounts of information produced by advanced technology, especially digitization, would be generated from many sources. In view of this, the Commandant of the Field Artillery School, Major General Randall L. Rigby, said, "Digitization of the force will require us to rethink the way we train the FA soldier and his commanders and staffs -- our frame of reference will have to shift."[69]

To meet the challenges the methods of training division artillery staffs had to change. Upon becoming the Assistant Commandant of the Field Artillery School, Brigadier General William J. Lennox, Jr., launched an initiative to improve such training. Because the division artillery staff had to interact with the division staff and subordinate field artillery units, training was difficult. Traditionally, training took place in division training exercises where the entire division staff and division artillery staff could respond to different tactical scenarios, share information, and pass orders. Although this method proved to be expensive, the lack of training time and personnel tempo provided the rationale for failing to conduct planned division command post exercises. General Lennox saw advanced technology in the form of simulations as a solution.[70]

In view of this, the Unit Training Division started a study in 1996 to determine the requirements for an automated division staff trainer that would use simulations to exercise

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[69]1996 USAFACFS ACH, pp. 67-68.

[70]Ibid., p. 68; Interview, Dastrup with LTC David Annen, Chief, Unit Training Division, WIDD, 14 Jan 98, Doc II-48; Memorandum for LTC D. Annen, WIDD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98, Doc II-49.

the division artillery staff and the fire support elements from the division's main and tactical command post in key staff functions. During the year, the division worked to define staff training requirements and current training deficiencies and to determine the feasibility of training a division artillery staff in three training environments -- live, virtual, and constructive.[71]

[71]1996 USAFACFS ACH, pp. 68-69; Memorandum for LTC David Annen, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.

Based upon the study that was completed early in 1997, a team headed by the Depth and Simultaneous Attack Battle Laboratory in the Field Artillery School conducted a concept experimentation program called the Division Artillery Staff Training Driver. As planned, the program would test the integration of automation, simulation, and digital operations for training division artillery staffs. Using a mission scenario and time-ordered events list, the experimentation team would transmit fire missions, message traffic, and unit movement data from the Digital Systems Test and Training Simulator (DSTATS) or the Fire Support Automated Test System (FSATS) to division artillery tactical operations center's (TOC) command and control systems during a command post exercise (CPX). Specifically, the DSTATS would stimulate the Interim Fire Support Automated System (IFSAS), and the FSATS would activate the Advanced Field Artillery Data System (AFATDS). To further replicate tactical scenarios the experimentation team would even send voice communications to the division artillery tactical operations center and the division's fire support elements. Staff performance would then be measured against expected standards developed for each event.[72]

Employing the results of the tests of October 1997 and January 1998, the Field Artillery School intended to develop requirements for an exportable, easy-to-use, digital trainer driver for field artillery units. The system would allow a field artillery staff to conduct realistic, high fidelity sustainment training using their own command and control equipment without any additional outside resources.[73]

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[72]Interview, Dastrup with LTC David Annen, 14 Jan 98; Fact Sheet, subj: Division Artillery Staff Training Driver, 2 Jan 98, Doc II-50; Memorandum for LTC David Annen, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.

[73]Interview, Dastrup with Annen, 14 Jan 98; Fact Sheet, subj: Division Artillery Staff Training Driver, 2 Jan 98; Memorandum for LTC David Annen, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.

FIRE SUPPORT COMBINED ARMS TACTICAL TRAINER

The Fire Support Combined Arms Tactical Trainer (FSCATT) originated as the Closed Loop Artillery Simulation System (CLASS) in 1990-91. Taking advantage of advanced technology, the U.S. Army Field Artillery (USAFAS) sought to introduce CLASS as the cornerstone of its Fire Support Training Strategy (FSTS), which was a portion of the Army's Combined Arms Training Strategy (CATS), to improve training and reduce optempo (fuel and ammunition) expenditures in the face of declining budgets.[74] Early in 1990, the School envisioned that CLASS would be a "system of systems," composed of a forward observer trainer, a fire direction trainer, and a howitzer simulator trainer, and would be issued to Army National Guard and Active Component (AC) units for sustainment training and the Field Artillery School for institutional training. As planned, CLASS would furnish effective training for the gunnery team in realistic fire missions by integrating its target acquisition, fire direction, and weapon delivery elements. With the projection of continued decreases in funding through the rest of the 1990s, however, CLASS could not stand on its merits solely as a field artillery trainer. CLASS had to meet the requirements of a Combined Arms Tactical Trainer (CATT) to survive the budget reductions.[75] After extensive discussions with the U.S. Army Training and Doctrine Command (TRADOC) and U.S. Army Simulation Training and Instruction Command (STRICOM) during the late months of 1992 and early months of 1993, the Field Artillery School redesignated CLASS as FSCATT and agreed to field it in two phases. Phase one would provide a gunnery team trainer. It would be a platoon-level training device to train the gunnery team to deliver accurate and predicted fires and would have the capability of being linked with CATT via distributive interactive simulation. Evolving from phase one, phase two would consist of a FSCATT that focused on platoon- through battalion-level combined arms training on a simulated, fully interactive, real-time battlefield. It would permit field

[74]1995 USAFACFS ACH, pp. 73-74.

[75]Ibid., p. 74; 1996 USAFACFS ACH, pp. 71-72.

artillery units and the fire support team to participate in the combined arms virtual battlefield.[76]

[76]1995 USAFACFS ACH, pp. 74-75; "FSCATT: Close-Loop Training of the FO, FDC, and Howitzer Section," Field Artillery, Jul-Aug 97, pp. 44-45, Doc II-51; Fact Sheet, subj: FSCATT, 6 Jan 98, Doc II-52. See 1996 USAFACFS ACH, pp. 71-78, and 1995 USAFACFS ACH, pp. 73-81, for more background on FSCATT.

As of 1997, FSCATT program consisted of the howitzer crew trainer (HCT), the howitzer strap-on trainer (HSOT), and the collective training control subsystem (CTCS). The howitzer crew trainer, both the M109A5 and M109A6 variants, realistically aimed, loaded, and fired rounds with the turrets recoiling when fired. Each howitzer crew trainer had an integral instructor-operator station for initiating and controlling training, recording and displaying data, evaluating crew performance, and generating after action reviews. Developed concurrently with the howitzer crew trainer for use primarily with towed howitzers, the howitzer strap-on trainer had an integral instructor-operator station that performed the same functions as its counterpart on the howitzer crew trainer did and sensors that attached to the actual weapon's fire control instrumentation. The strap-on trainer would supplement the howitzer crew trainer with self-propelled units. The collective training control subsystem, in the meantime, would record all pertinent operational data from the forward observation trainer (the Guard Unit Armory Device Full-Crew Interactive Simulation Trainer, known as GUARDFIST), the fire direction station, and howitzer firing elements and furnish after action reports. The collective training control subsystem also tied FSCATT together through interface with GUARDFIST, stimulation of the unit's fire direction center computer for fire direction center training, control of collective training, ballistic simulation and computation, and consolidation of evaluation data.[77]

FSCATT provided stand-alone, interactive, and closed-loop training. In the stand-alone mode each trainer could be employed independently to train individual tasks and functions. The interactive mode permitted combined howitzer and fire direction center training by matching several howitzer trainer configurations with organic fire direction center computers and the CTCS's fire direction center subsystem. In the close-loop mode the observer's call-for-fire would be transmitted from GUARDFIST to the battery fire direction center with fire commands being sent to the howitzers (the howitzer crew trainer or howitzer strap-on trainer). The data set and fired signal would be sent by the howitzer crew to the GUARDFIST, which would convert them to

[77]"FSCATT: Closed-Loop Training of the FO, FDC, and Howitzer Section," p. 45.

"did-hit" data. The impact of the "did-hit" data would be displayed on the GUARDFIST for further correction by the observer.[78]

CONTRACTING OUT MANUALS

[78]Ibid., p. 45; Dr. Linda G. Pierce and Walter W. Millspaugh, "Simulations to Train and Develop the 21st Century FA," Field Artillery, Jul-Aug 97, pp. 39-42, Doc II-53.

In 1995 two critical developments changed the way that the U.S. Army Field Artillery School (USAFAS) produced field manuals (FM) and mission training plans (MTP) manuals. Early in the 1990s, the School abolished the Doctrine Division, which oversaw the writing of doctrine, and the Individual and Unit Training Division, which wrote training manuals, in the Directorate of Training and Doctrine because of budget reductions. The School subsequently decentralized the writing of doctrinal and training manuals by shifting responsibility to the training departments. For example, the Directorate of Training and Evaluation, which was created by the merger of the Directorate of Evaluation and Standardization and the Directorate of Training and Doctrine in 1993, produced training material, while the Fire Support and Combined Arms Operations Department (FSCAOD) wrote battalion and corps doctrine. However, no organization oversaw the writing process, and the production of manuals fell behind schedule. As a result, many manuals became obsolete by the mid-1990s because they had not been revised since the late 1980s or early 1990s. At the same time the School lost expertise in writing doctrinal and training manuals. Many civilian writers retired, and some were lost through reductions-in-force. Those remaining with experience in writing doctrinal and training manuals were distributed throughout the School to other positions.[79]

In view of the situation, the Assistant Commandant of the Field Artillery School, Brigadier General Leo J. Baxter, decided that someone had to oversee the writing process and that someone had to write the manuals. To manage the process the School created the Warfighting Integration and Development Directorate (WIDD) in 1995. Other School departments and directorates still participated in writing doctrinal manuals, but WIDD, specifically the Doctrine Branch, oversaw the process to centralize control. At the same time the School started contracting out the writing of manuals because it was less expensive than hiring civilians and writing them in-house and signed a contract with MPRI, a company that had worked for the School previously on other projects, to write manuals.[80]

During 1996, the School made significant progress publishing manuals as a result of the contracting-out process. Of its three field manuals MPRI completed FM 6-15 (Field Artillery Meteorology) and provided initial drafts for review and comments on FM 6-20-1 (Corps and Division Artillery) and FM 6-20-2 (Field Artillery Cannon Battalion). In the meantime, the School contracted with TechMasters in 1996 for FM 6-20 (Fire Support) and FM 6-20-30 (Fire Support for Corps and Division).[81]

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[79]1995 USAFACFS ACH, pp. 81-82.

[80]Ibid., pp. 82-83.

[81]1996 USAFACFS ACH, p. 80; Msg, Bo Bielinski, Chief,

Although headway was being made to update field manuals and mission training plans, the School encountered a problem with serious ramifications on the production of manuals. Budget cuts in 1996 left the School with insufficient money to print locally and distribute the initial and final drafts of three manuals (FM 6-20-1, FM 6-20-2, and FM 6-20-30) in the quantity that would allow review and comments by the affected field artillery units. Previously, the School would have sent FM 6-20-2 to all corps artilleries, division artilleries, and field artillery brigades in both the active Army and National Guard for review.[82]

Doctrine Branch, WIDD, to Command Historian, subj: Contracting out Manuals, 11 Feb 98, Doc II-54.

[82]1996 USAFACFS ACH, pp. 80-81.

In view of this, the School looked for a less expensive way than coordinating them in hard-copy format. The School examined the possibility of staffing them electronically through the Internet and worked with its own Information Management Office and the Directorate of Plans, Training, and Mobilization at Fort Sill to make it happen. However, security raised concerns. Pass words would have to be given out to restrict access to only those authorized to read the manuals. Given this, the School had not decided on a method of staffing as 1996 drew to a close, even though the U.S. Army Training and Doctrine Command (TRADOC) in 1996 established the requirement for electronic staffing of manuals to only authorized personnel.[83]

Early in 1997, the question of electronic staffing manuals arose at a TRADOC Semi-Annual Doctrine Conference because other TRADOC service schools were having the same problems with passwords as the Field Artillery School was. There, however, was a notable exception. Fort Leavenworth had already begun posting draft manuals on its homepage without requiring a user identification or pass word. In response to Fort Leavenworth's success and the problems with passwords, TRADOC said that a manual could be placed on a homepage without requiring a password or user identification in order to be read unless the manual had a restricted distribution. TRADOC also said that draft manuals on the Internet should have a warning statement that it was a draft and not approved Army doctrine until it was formally accepted and signed.[84]

Meanwhile, the budget cuts forced the Field Artillery School to cease the contracting out of manuals in 1997. Before this occurred, however, TechMasters completed an initial draft of FM 6-20-30 and a final draft of FM 6-20, while MPRI produced a final draft of FM 6-20-1 and a final

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[83]Ibid., p. 81.

[84]Msg, Bielinski to Dastrup, 11 Feb 98.

draft of FM 6-20-2. Given TRADOC guidance, the Field Artillery School placed all of them on Fort Sill's home page on the World Wide Web for review and comments.[85]

[85]Interview, Dastrup with Bo Bielinski, Doctrine Branch, WIDD, 28 Jan 98, Doc II-55.

Of the field manuals, completing FM 6-20 proved to be the most challenging. In 1996-97 Joint Publication 3-09 (Doctrine for Joint Fire Support) generated interservice debates over definitions and other critical issues. In the meantime, the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, rewrote FM 100-5 (Operations) and introduced new ideas and terms in the manual. Together, Joint Publication 3-09 and the Command and General Staff College effort caused work on FM 6-20 to stop in 1997. Writers in the Field Artillery School had to wait for the other publications to be completed before continuing with FM 6-20 because the Field Artillery manual had to be in line with the thinking of the other two manuals. In fact, the School did not plan to begin work again on FM 6-20 until 1998 because the draft of FM 100-5 would not be finished until February 1998.[86]

Concurrently, the U.S. Marine Corps asked the Field Artillery School to dual-designate field artillery manuals. In the past the Marine Corps had used Army manuals, in this case, field artillery manuals. In doing so, the Marine Corps tacitly recognized the Army field manuals as doctrine. In 1996 this changed. The Corps wanted to participate in the writing process to ensure that the manuals satisfied their needs. As of 1996, some field manuals were included in the dual-designation of manuals.[87]

In 1997 the Army and Marine Corps solidified the dual-designation process. Initially, the Army approved the manual after it had been written by Army and Marine writers and sent it to the US Marine Corps Combat Development Command, Quantico, Virginia, to receive a Marine Corps numerical designation. Thus, each manual in the dual-designation system had two numbers. One was an Army number, and the other was a Marine Corps one. During the year, however, the Marine Corps Combat Development Command transferred proponency for fire support publications to the Marine Corps Detachment at Fort Sill but never staffed or funded the additional work. Nevertheless, the Detachment gave WIDD one officer to write and coordinate Marine Corps publications with the Army and to review Army publications.[88]

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[86]Ibid.

[87]1996 USAFACFS ACH, p. 81.

[88]Interview, Dastrup with Bielinski, 28 Jan 98.

CHAPTER THREE
COMBAT DEVELOPMENTS: FORCE DESIGN, EQUIPMENT REQUIREMENTS, AND DOCTRINE

INTRODUCTION

During 1997, the U.S. Army Field Artillery School pursued key initiatives to make the Field Artillery more lethal, deployable, and responsive to meet Force XXI and Army After Next requirements. The School worked on developing doctrine, tactics, techniques, and procedures; made significant progress towards introducing new equipment and weapons; and participated in the U.S. Army's Advanced Warfighting Experiments.

HONING THE EDGE

In December 1997 the Commanding General of the Field Artillery Center and Fort Sill, Major General Leo J. Baxter, outlined the state of the Field Artillery and the direction that it was moving in support of Army XXI and Army After Next initiatives. Basically, the Advanced Warfighting Experiments (AWE) promised to shape the Army and Field Artillery in the twenty-first century. In the Focus Dispatch AWE the Field Artillery School validated the indispensable role of fire support in a fully digitized force. Conducted at Fort Knox, Kentucky, during 1995, the experiment explored sensor-to-sensor connectivity, digitally linking, for example, an Abrams tank with a howitzer to execute calls for fire. Prairie Warrior exercises held at Fort Leavenworth, Kansas, verified the requirement for a command and control headquarters for fire support. Prairie Warrior 95 demonstrated the versatility of division artillery in executing emerging operational concepts, such as the artillery-based strike force, and more classic missions, such as counterfire. Prairie Warrior 96 and 97 subsequently highlighted fires as a potentially dominant force on the twenty-first century battlefield, while the Task Force XXI AWE at the National Training Center at Fort Irwin, California, showed that fire support was capable of shaping the battle space and setting the conditions for decisive maneuver.[1]

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[1]MG Leo J. Baxter, "Honing the Edge: State of the Field Artillery 1997," Field Artillery, Nov-Dec 97, p. 1,

Doc III-1; MAJ Vince C. Weaver, Jr., "Fires in AWE Focus Dispatch: A Step Toward Task Force XXI," Field Artillery, Mar-Apr 96, pp. 38-40, Doc III-2.

One example of the direct impact of the AWEs on fire support centered on the Army's Warfighting Rapid Acquisition Program (WRAP). Based upon results from Task Force XXI AWE, the Army Chief of Staff approved eleven critical combat multipliers for rapid acquisition. The Field Artillery had three of the eleven -- the vehicle for the Striker platoon, the gun laying and positioning system, and the lightweight laser designator rangefinder. Striker emerged as the most important and was accorded the number one position on the WRAP list. As conceived in 1997, Striker would be a high-mobility wheeled vehicle (HMMWV)-based combat observation lasing team that would furnish mobile, digitized observation.[2]

General Baxter further explained that modernizing during peacetime ensured force protection and victory during war. To this end the Army and Field Artillery were working to acquire the Crusader 155-mm. self-propelled howitzer as the cutting edge cannon for the twenty-first century and a lightweight 155-mm. howitzer for the light forces that would provide increased lethality, tactical mobility, and survivability. Launcher improvements to the Multiple Launch Rocket System (MLRS), in the meantime, would enhance the ground commander's combat power through reduced mission times, faster reload times, and improved survivability, while the High Mobility Artillery Rocket System would support the early entry forces. Both systems would fire new MLRS munitions. The Army Tactical Missile System would give depth and precision a new meaning. All of these weapons systems would be tied to Firefinder target acquisition systems that were being upgraded and the Advanced Field Artillery Tactical Data System that would be the digital center of gravity for fires in the twenty-first century.[3]

CHANGE IN NCO STRUCTURE

Over the last ten years the percentage of noncommissioned officers (NCO) in the enlisted force structure in the active Army steadily increased, according to a study completed by the Department of Army in April 1996. In 1989 approximately forty-seven percent of the enlisted force structure consisted of noncommissioned officers. As of late 1995 and early 1996, noncommissioned officers composed about fifty percent of the enlisted personnel. Most likely caused by the turbulence from the drawdown in the force structure since 1989, the expansion in the tables of distribution and allowance (TDA) Army, and the reductions in the tables of equipment (TOE) Army, the growth increased military personnel costs. At the same time it created grade imbalances in many of the Army's military occupation specialties (MOS), meaning too many authorizations in one grade and too few in another. The imbalance restricted promotion opportunities in some MOSs, causing career

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[2]Baxter, "Honing the Edge," p. 1.

[3]Ibid., pp. 2-4.

progression to stagnate.[4]

[4]Msg, HQ DA to Cdr, TRADOC, subj: Enlisted Grade Growth, undated, Doc III-3; Msg, subj: EPMD Update #5, 21 Jun 96, Doc III-4; Briefing, subj: Enlisted Grade Growth, 2 May 96, Doc III-5; Msg, HQDA to Cdr, TRADOC, et al, subj: Enlisted Grade Growth, 18 Jun 96, Doc III-6; Fact Sheet, subj: NCO Reduction, 3 Jul 96, Doc III-7.

At the same time the study recommended that noncommissioned officers should compose forty-seven percent of the enlisted force for a decrease of three percent. This would support end strength requirements and costs and would maximize promotion potential and stability across the MOSs. As the study indicated, forty-seven percent was an average across all the MOSs with some having a higher or lower percentage of noncommissioned officers depending upon their respective grade structure.[5]

Based upon the study's findings, the Vice Chief of Staff of the Army, General Ronald H. Griffith, initiated a program to reduce the current Army noncommissioned officer content of fifty percent to forty-seven percent by Fiscal Year 2000. Guidelines established by the Department of Army charged branch proponents to review their MOSs and to restructure them by increasing or decreasing the percent of noncommissioned officers as appropriate. At the same time the proponents had to use the U.S. Army Total Personnel Command (PERSCOM) average grade distribution matrix to bring their promotion pyramids closer to the Army model for good career progression.[6]

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[5]Msg, HQDA to Cdr, TRADOC, et al, subj: Enlisted Grade Growth, 18 Jun 96; Msg, HQ DA to Cdr, TRADOC, subj: Enlisted Grade Growth, undated; Fact Sheet, subj: NCO Reduction, 3 Jul 96.

[6]SGM Wayne S. Hashimoto and CSM William J. Perry III, "FA NCO: Restructuring, FY 2000," Field Artillery, Sep-Oct 97, p. 13, Doc III-8; Fact Sheet, subj: NCO Reduction, 3 Jul 96; Msg, Cdr, FORSCOM, to Cdr, I Corps, et al, subj: Staffing of NCO Restructuring Initiative, 100800Z Feb 97, Doc III-9; Memorandum for Record, subj: Reducing NCO Grade Growth, undated, Doc III-10; Msg, HQDA to Cdr, TRADOC, subj: Enlisted Grade Growth, 271205Z Jun 96, Doc III-11;

Memorandum, subj: Change in NCO Structure, 17 Jul 96, Doc III-12; Fact Sheet, subj: CINCOS, undated, in Senior Fire Support Conference Packet, 9-13 Feb 98, Doc III-13.

Although the decision to reduce the percentage of noncommissioned officers was difficult, the Department of the Army explained that it had salutary effects. First, it would maintain the Army's end strength at 495,000 in Fiscal Year 2000 and avoid a 20,000 reduction in end strength by decreasing spending on military personnel. Second, it would correct the imbalances. Third, it would refine the drawdown that had started in 1989.[7]

After reviewing all MOSs, seeking recommendations and comments from the field, and applying direction from the Assistant Commandant of the Field Artillery School to ensure viable career progression, the task force created by the Field Artillery Proponency Office formulated restructuring proposals in 1996-97. It forwarded them through TRADOC early in 1997 to the Chief of Staff of the Army. Approved by the Chief of Staff in June 1997, the eight proposals improved grade distribution within each MOS in Career Management Field (CMF) 13, created MOS 13D, Tactical Data Systems Specialist, and improved career progression in nine of ten CMF 13 MOSs. Only

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[7]Briefing, subj: Reduction in NCO Structure, 25 Jun 96, Doc III-14; Briefing, subj: Reduction in NCO Structure (Draft), Jul 96, Doc III-15; Msg, HQ DA to Cdr, TRADOC, subj: Enlisted Grade Growth, 271205Z Jun 96; Memorandum with Enclosures, subj: NCO Grade Growth, 19 Jun 96, Doc III-16; Memorandum for Record, subj: Reducing NCO Grade Growth, undated; Msg, HQDA, to Fort Sill, et al, subj: NCO Reduction, 28 Jun 96, Doc III-17.

MOS 93F, Field Artillery Meteorological Crewmember, remained unaffected. The task force was unable to find a way to restructure 93F positions because of manning and grading levels required to meet equipment configurations.[8]

To reach the target implementation date of 2000 required programming recruiting and retention incentives to meet the increases or decreases in the various MOSs. Ultimately, this meant a surge of training for some MOSs and a decrease in others and reviewing programs of instruction to ensure teaching the proper material.[9]

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[8]Hashimoto and Perry, "FA NCO: Restructuring, FY 2000," pp. 13-15; Msg, Hashimoto to Maple Pollack, subj: NCO Restructure, 4 Feb 97, Doc III-18; Fact Sheet, subj: Change in NCO Structure, 14 Jan 98, Doc III-19; Memorandum, MG Randall L. Rigby, Cdr, USAFACFS, to LTG Theodore G. Stroup, Jr., Deputy Chief of Staff for Personnel, 1 Jul 96, Doc III-20; Msg, CSM William J. Perry III to Hashimoto, subj: CINCOS Update, 31 Mar 97, Doc III-21.

[9]Hashimoto and Perry, "FA NCO: Restructuring, FY 2000," p. 15.

OFFICER PERSONNEL MANAGEMENT SYSTEM TASK FORCE XXI

During the last twenty-five years, the Army worked hard to keep its Officer Personnel Management System (OPMS) abreast of the times. Conducted in 1971 and implemented in 1974, OPMS I recommendations centralized the command selection process, designated command tours, created primary and secondary specialties for officers, and abolished the Chemical Corps. Upon being approved in 1984 and implemented in 1985, OPMS II of 1983 established single branch development, functional areas not related to any branch, multiple career tracks, and a revised officer classification system.[10]

Meanwhile, Congress passed the Defense Officer Personnel Management Act (DOPMA) in 1980 after seven years of legislative debate. DOPMA was a rigid system with officer strength caps, grade ceilings, and up-or-out promotion policies. With limited flexibility accorded by DOPMA during downsizing, many officers were eliminated who had hard skills and advanced education. The Army failed to promote and retain them as lieutenant colonels or colonels because they frequently lacked command time that was critical for promotion to those grades.[11]

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[10]LTC Rhett A. Hernandez and MAJ Terry M. Lee, "OPMS XXI: What Does It Mean for Your Future," Field Artillery, Sep-Oct 97, p. 16, Doc III-22; Briefing, subj: An Officer Corps for the 21st Century, OPMS XXI, 1997, Doc III-23; Officer Guide, "What is OPMS XXI," p. 4, Doc III-24; LTC Donald J. Burnett, "Officer Personnel Management System XXI," Army Research, Development, and Acquisition, Sep-Oct 97, pp. 6-8, Doc III-25.

[11]CPT Brayton Harris, "At Long Last: DOPMA . . . How Long Will It Last?" U.S. Naval Institute Proceedings, Sep 81, pp. 129-31, Doc III-26; LT Greg D. Rowe, "What Happened to the Pyramid?" U.S. Naval Institute Proceedings, Jul 97,

pp. 80-81, Doc III-27; Msg, subj: DOPMA, 19 Feb 98, Doc III-28.

Since DOPMA of 1980 and OPMS II of 1983, profound developments influenced the Army's officer corps. The Defense Reorganization Act (Goldwater-Nichols) of 1986 established joint officer personnel policy and increased joint requirements, while the Defense Acquisition Workforce Improvement Act of 1989 created the Army Acquisition Corps. Subsequently, severe budget constraints of the 1990s forced the Army to be reduced from eighteen to ten divisions and simultaneously decreased the available resources to train, equip, support, and sustain the force. The reductions in the size of the force and amount of resources occurred in the midst of increasing operational demands that strained the Army's ability to respond. At the same time rapid technological advances permitted the Army to evolve towards an information-based organization.[12]

Understanding that the changes over the past decade had an impact on officer management, the Chief of Staff of the Army, General Dennis J. Reimer, convened OPMS XXI Task Force in July 1996. He directed the task force to examine current officer management practices and to ensure that they met the needs of the Army and did not hamper warfighting capabilities. As a part of its study that was conducted in 1996 and briefed to the Army Chief of Staff in January 1997, the task force noted that the turbulence in the officer corps caused by the force reductions, among other things, also influenced managing the officer corps. For example, field grade officers rotated in and out of units too frequently during recent years, while the officer inventory could only fill approximately seventy-five percent of the officer authorizations for field grade officers.[13]

To minimize the above problems and to meet the requirements of Army XXI and the Army After Next, the task force outlined significant modifications in managing, developing, and promoting officers. As explained at the briefing to the Chief of Staff of the Army in January 1997, the options ranged from making simple adjustments to the current system to organizing the Army into four career

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[12]Briefing, subj: An Officer Corps for the 21st Century, 1997.

[13]Ibid.; Hernandez and Lee, "OPMS," p. 16.

fields.[14]

[14]Briefing, subj: An Officer Corps for the 21st Century, OPMS XXI, 1997; Hernandez and Lee, "OPMS XXI," p. 16; Officer Guide, "What Is OPMS XXI," p. 4.

The latter option, which the Chief of Staff of the Army directed to be implemented, effected field grade officers. While career fields for company grade officer would remain basically the same, those for field grade officers would be grouped by interrelated branches and functional areas into occupation categories. To meet the needs of the operational army, the task force organized the operations career field that would be composed of officers with training, education, and experience in army operations. Recognizing the emergence of advanced information technology and the need to manage it, the task force formed an information operations career field. The task force organized an institutional support career field to manage, plan, and program Army resources, while the operations support career field focused on liaison, procurement, programming, and development specialties.[15]

The proposed career field program would change the promotion system. Under the existing career program, an officer had to follow the traditional command path -- attend the U.S. Army Command and General Staff College and serve as an executive officer, an S-3, or brigade fire support officer -- to continue past major. Despite the needs of the Army and desires of the individual officer, the promotion system forced officers to follow a common command path to be promoted. Because the Army required officers with special skills, education, and training to be promoted differently, OPMS XXI Task Force devised a new system for promotion. The career field designation and development process would begin upon selection to major. At that time the officer would submit a career field preference statement. It would indicate the desired field in which the officer would like to be managed and developed. The preference statement, the officer evaluation report, and the recommendation of a centralized selection board would determine the officer's career field. Final approval of an officer's career field would be made by the Office of the Chief of Staff of the Army. Although the Field Artillery fell in the operations career field, only about sixty-five percent of the Field Artillery majors for a given year group would be placed in the operations career field. The rest would serve in the other three career fields. If, for example, a Field Artillery officer were selected for

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[15]Hernandez and Lee, "OPMS XXI," pp. 16-17; Officer Guide, "What Is OPMS XXI," pp. 5-6; Briefing, subj: An Officer Corps for the 21st Century, 1997.

the operations career field, the individual would serve in an operational unit in a branch-qualifying position, such as an operations officer, executive officer, or brigade fire support officer, and could possibly become a battalion commander. The other thirty-five percent would have repetitive assignments in their designated functional areas and functional integrator positions in their designated career field and become specialists.[16]

[16]Hernandez and Lee, "OPMS XXI," p. 17; Officer Guide, "What Is OPMS XXI," pp 6-7; Msg, subj: DOPMA, 19 Feb 98.

Regardless of the career field, every officer would have a reasonable chance for success. Chances for promotion to lieutenant colonel and colonel would better under the new system than existing one. Officers would compete for promotions only in their designated career field and against only other officers from that career field. However, command positions would be filled by only those in the operations career field.[17]

Implementing the OPMS XXI began on 1 October 1997 and was scheduled to continue through Fiscal Year 2002. The implementation schedule would provide officers with time to react to the OPMS, permit a smooth transition from the old to the new, and minimize disruptions in the careers of officers.[18]

At the same time OPMS XXI promised to be an improvement over the previous OPMS. As the culmination of thorough research and study, OPMS XXI would enhance the fighting capability of the Army by increasing branch qualification time and reducing officer turbulence for the branches. In addition, OPMS XXI would provide officers with a reasonable opportunity for success by enhancing promotion and command opportunities, would also balance grades and skills at the field grade level, and would comply with DOPMA.[19]

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[17]Hernandez and Lee, "OPMS XXI," p. 17; Briefing, subj: An Officer Corps for the 21st Century, 1997.

[18]Hernandez and Lee, "OPMS XXI," pp. 17-18; Officer Guide, "What is OPMS XXI," pp. 9-14.

[19]Briefing, subj: An Officer Corps for the 21st Century, 1997; Briefing, subj: OPMS XXI Recoding, Aug 97, Doc III-29; Briefing, subj: FA Recoding, 7 Oct 97, Doc III-30; Briefing, subj: FA Recoding, 10 Dec 97, Doc III-31; Hernandez and Lee, "OPMS XXI," p. 16; Msg, subj: DOPMA, 19 Feb 98; Interview, Dastrup with LTC W. Rigby, Chief, Field

THE ADVANCED WARFIGHTING EXPERIMENTS

The U.S. Army Field Artillery School created Task Force (TF) 2000 in 1994 to act as the Field Artillery proponent and oversight office for field artillery initiatives and experiments in the Army's Advanced Warfighting Experiments (AWE). As a vital part of the Army's Force XXI effort to design and field the digital force for the twenty-first century, the AWEs allowed the Army to examine innovative approaches to battle command and warfighting, enabled by information-age technologies, using constructive, virtual, and live simulations.[20]

Artillery Proponency Office, 20 Jan 98, Doc III-32.

[20]1996 USAFACFS ACH, pp. 94-95.

In 1995-97 TF 2000 participated in five AWEs that were part of the Joint Venture campaign, the overall Army effort to move its force into the twenty-first century. From February to September 1995, the Army conducted Focused Dispatch AWE for heavy forces at Fort Knox, Kentucky. The AWE consisted of a series of constructive and virtual simulations that were followed by a field training exercise with a portion of the forces live and a part portrayed in virtual and constructive simulations. Focused Dispatch examined emerging doctrine, tactics, techniques, and procedures (DTTP) for digitized armored and mechanized infantry forces, including digital linkages of sensors to indirect fire assets to exploit the increased situational awareness that digital systems offered.[21]

Although tentative observations that digital communications enhanced flexibility for observers and that careful fire support planning was critical when employing sensor-to-shooter links were reached in 1995, firm conclusions emerged in 1996. Focused Dispatch demonstrated the necessity of integrating mortars into the commander's scheme of fires, the requirement for the development of a digitized tactics, techniques, and procedures (TTP) manual for the Army's experimental force, the potential for any sensor to communicate with any fire support node, and the advantages and disadvantages of sensor-to-shooter links. For example, the AWE upheld the absolute need for fire supporters at all levels of command, regardless of the degree of digitization, to clear and integrate fires into the commander's scheme of maneuver.[22]

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[21]1995 USAFACFS ACH, pp. 97-98; USAFAS, Proposed Operational Concept for Field Artillery Experimentation in Task Force XXI (Draft), ca. 1995, p. 3, Doc III-33.

[22]1996 USAFACFS ACH, pp. 95-96; MG Leo J. Baxter, "Honing the Edge: State of the Field Artillery 1997," Field Artillery, Nov-Dec 97, p. 1, Doc III-34; Focus Dispatch Fire Support After Action Review Comments, undated, Doc III-35; Memorandum for See Distribution, subj: Focused Dispatch AWE

Fire Support Observations from the Live/Virtual Exercise (Executive Summary), 15 Sep 95, Doc III-36; Briefing, subj: Focused Dispatch, 5 Sep 95, Doc III-37.

Shortly afterwards, Task Force 2000 took part in the Warrior Focus AWE at the Joint Readiness Training Center (JRTC) at Fort Polk, Louisiana, in November 1995. A light forces warfighting experiment, Warrior Focus compared the performance of a conventional, non-digitized light task force with a fully digitized light task force. During the AWE, Task Force 2000 examined the employment several digital and advanced fire support systems: the Advanced Field Artillery Tactical Data System (AFATDS), the Advanced Towed Cannon System (ATCAS) prototype (renamed Lightweight 155-mm. Towed Howitzer in 1996 and XM777 in 1997), the M119 towed 105-mm. howitzer with the Gun Laying Positioning System (GLPS) and the surrogate Lightweight Laser Designator-Range Finder (LLDRF). The task force intended to gain insights on whether or not there was an increase in the lethality and tempo of fire support to match the capability of a light force operating in a shared-information environment. Lessons revealed that AFATDS effectively supported the operating tempo of light forces, that the digitization of the lightweight 155-mm. towed howitzer would be a good investment, and that the GLPS was a success and a quality replacement for conventional survey.[23]

A few months later, the Army conducted the Prairie Warrior/Mobile Strike Force 96 AWE at the U.S. Army Command and General Staff College, Fort Leavenworth, Kansas, in May 1996. Prairie Warrior experimented with a select group of students staffing a division-size unit known as the Mobile Strike Force, which employed advanced battle command concepts, command, control, communications, computers, and intelligence (C4I) systems, and weapon systems anticipated for 2010. Fire support issues examined included AFATDS integration in the division fire support structure and employment of field artillery strike forces. The 1996 Prairie Warrior AWE along with the 1997 Prairie Warrior AWE demonstrated the necessity of preserving the division artillery as the command and control headquarters of the division's fire support assets, the validity of combined arms formations designed to accomplish specific missions with fires (artillery strike force), the requirement for two field artillery brigades to

[23]1996 USAFACFS ACH, p. 97; USAFAS, Proposed Operational Concept for Field Artillery Experimentation in Task Force XXI, ca. 1995, pp. 8-9.

reinforce the fires of a committed division, and the need for a synchronized effort in shaping the battle space at division level.[24]

[24]1996 USAFACFS ACH, pp. 97-98; Baxter, "Honing the Edge," p. 1; Prairie Warrior 1996, Key Fire Support Insights (Extract) taken from Executive Summary, Final Report, Doc III-38.

Building on the AWEs of 1995-96 and using live and constructive simulations in 1996-97 that culminated with a brigade task force rotation at the National Training Center, Fort Irwin, California, the Task Force XXI AWE had a specific objective. The AWE experimented with a modernized brigade combat team of two heavy battalions, one light infantry battalion, and a brigade support slice to demonstrate the potential force effectiveness increases achieved by digitization. The digitization included adding new information-age systems, incorporating new concepts, organizational designs, and employment methods, and developing digitized TTP. Also, the AWE provided information for Force XXI on operational and organizational concepts and materiel acquisition opportunities and assessed the doctrinal, training, leadership, organization, materiel, and soldier impacts of information-age technologies. Ultimately, Task Force XXI AWE intended to help move the Army from an Industrial-Age force to an Information-Age one.[25]

Given the desire to develop a digitized force, computer-based appliques formed the centerpiece of the AWE. Designed to provide near-real time situational awareness and to interface with the Field Artillery's AFATDS and the Army Tactical Command and Control System (ATCCS), the appliques furnished near-real time situational awareness and digital command and control at brigade and below. The appliques consisted of computer hardware, installation kits, and systems and application software. The appliques were installed on Task Force XXI AWE weapon platforms and vehicles at brigade and below and deployed with individual dismounted soldiers. Each applique device maintained its own position and transmitted it automatically at regular intervals to other applique devices throughout the brigade. Thus, each applique-equipped vehicle or soldier knew where other similarly equipped vehicles or soldiers were in its battlespace. Experimenting with the appliques, AFATDS, ATCCS, the first-ever tactical internet, and the other digital communications systems, the AWE hoped to determine their ability to tie army units into one digital information network, to pass

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[25]TF XXI Experiment Directive (Extract), undated, pp. 1-1, 1-2, Doc III-39; Proposed Operational Concept for Field Artillery Experimentation in Task Force XXI (Draft), undated, p. 10; Msg, subj: CSA 97-05 Random Thoughts While Running, 30 Apr 97, Doc III-40; Task Force XXI Final Report, Executive Summary, Oct 97, pp. 2-3, Doc III-41; COL Thomas R. Goedkoop and CPT Barry E. Venable, "Task Force XXI: An Overview," Military Review, Mar-Apr 97, p. 71, Doc III-42; Col Steven A. Emison, "Post Task Force XXI Advanced Warfighting Experiment," Army Research, Development, Acquisition, Sep-Oct 97, pp. 2-5, Doc III-43. See TRADOC Pamphlet 525-5, Force XXI Operations, 1 Aug 94, for background information, Doc III-44.

information rapidly and efficiently, and to permit planning and executing digitally. For the Field Artillery, any applique-equipped soldier could serve as a digital sensor for indirect fires by interfacing with AFATDS. In the Task Force XXI Final Report, the Commanding General of TRADOC, General William W. Hartzog, provided a summary of the applique's impact by saying that it provided leap ahead capabilities in fighting units in terms of position location.[26]

[26]Task Force XXI Final Report, Executive Summary, Oct 97, pp. 2, 11; Task Force XXI Experiment Directive (Extract), undated, p. 1-2, 1-3; CPT Henry M. Hester, Jr., "Digitization in Task Force XXI," Field Artillery, Sep-Oct 96, pp. 38-40, Doc III-45; Goedkoop and Venable, "Task Force XXI," pp. 72-73; Fact Sheet, subj: Force XXI Battle Command Brigade and Below, undated, in Senior Fire Support Conference Packet, 9-13 Feb 98, Doc III-13.

Although the appliques and ATCCS were the primary information systems of Task Force XXI, the tactical internet, a concept for connecting the Army's primary tactical communications systems -- the improved single-channel ground and airborne radio system (SINCGARS), enhanced position location reporting system (EPLRS), and mobile subscriber equipment (MSE) -- into a tactical data network, played an equally important role. Basically, the tactical internet consisted of an EPLRS net for transmitting and receiving digital signals, SINCGARS radio nets for voice and digital communications, and a Surrogate Data Radio (SDR) for data communications. The internet transmitted digital messages and found the optimal route to the destination. By eliminating the need for electronic line of sight and increasing the range of communications, the tactical internet had the potential of revolutionizing digital communications as the AWE demonstrated.[27]

[27]Hester, "Digitization in Task Force XXI," p. 40; Task Force XXI Final Report, Executive Summary, Oct 97, p. 10; Goedkoop and Venable, "Task Force XXI," p. 73.

Meanwhile, Task Force 2000 and the Field Artillery School developed nine initiatives for the Task Force XXI AWE with the objective of employing advanced technology to make fire support more responsive to the needs of the maneuver forces.[28] The heavy forces depended upon the AFATDS and the M109A6 Paladin 155-mm self-propelled howitzer. The two Paladin platoons had a prototype Fire Direction Center (FDC) vehicle, which was a retrofitted M992 with AFATDS, SINCGARS, Applique, and FDC equipment. Fire support for heavy force maneuver units received a boost from the experimental fire support team vehicle, a Bradley fighting vehicle for fire support coordinators at company through battalion levels, while High Mobility Multipurpose Wheeled Vehicle (HMMWV)-mounted Striker teams, formed by reorganizing combat observation and lasing teams (COLTS) into a platoon organization, assisted fire support execution in heavy and light maneuver forces. Two other initiatives, the Firefinder AN/TPQ-36 Version 8 Radar and the AN/TQM-41 Meteorological Measuring System, also enhanced the capability and accuracy of fires. The direct support 105-mm. howitzer battery in the light force had the Lightweight Laser Designator/Rangefinder (LLDR) and Gun Laying Positioning System (GLPS) to improve fires.[29] Shortly after the AWE had been completed, the Field Artillery School provided tentative observations early in 1997 about the nine initiatives. Although all nine enhanced force lethality, survivability, and tempo and showed promise, the Chief of Staff of the Army approved only three of the initiatives for inclusion in the Warfighting Rapid Acquisition Program (WRAP) -- the Striker, the GLPS, and the LLDR.[30] In an article in the November-December 1997 issue of the Field Artillery, the Commanding General of the U.S. Army Field Artillery Center and Fort Sill, Major General Leo J. Baxter, explained, "Striker emerged from the AWE as a clear winner and was accorded the Number 1 position on the WRAP list."[31] The Striker was HMMWV-

[28]USAFAS, Proposed Operational Concept for Field Artillery Experimentation in Task Force XXI (Draft), undated, p. 10; Fact Sheet, subj: Task Force XXI AWE, 25 Jan 96, Doc III-46; Briefing, subj: Task Force XXI, undated, Doc III-47.

[29]Briefing, subj: Fire Support Initiatives, undated, Doc III-48; Briefing, subj: Task Force XXI, undated; Fact Sheet, subj: Task Force XXI AWE, 25 Jan 96; Briefing, subj: Force XXI, undated; Goedkoop and Venable, "Task Force XXI," p. 75. See LTC Douglas G. Beley, "AFATDS and the Task Force AWE," Field Artillery, Jan-Feb 98, pp. 3-5, Doc III-49, for more information on AFATDS.

[30]Briefing, subj: Task Force 2000 in Support of AWE, Feb 98, Doc III-49A.

[31]Baxter, "Honing the Edge," p. 1.

based combat observation lasing team that gave the maneuver commander an extremely mobile, digitized forward observer team. The AWE demonstrated that the Striker showed great potential in bringing indirect fires onto the enemy early enough to set the conditions for the decisive fight and was virtually invisible to the enemy. A man-portable tripod-mounted gyroscope with an eyesafe laser rangefinder, the GLPS furnished firing batteries, especially light ones, with accurate autonomous positional and directional information and eliminated their dependency upon the battalion for accurate survey. The LLDR supplied man-portable laser designating capability for accurate target location and allowed the observer to locate targets out to ten kilometers to an accuracy of eighty meters and to designate mobile targets at three kilometers and stationary targets out to five kilometers.[32] For light units the LLDR was a "must."[33]

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[32]Ibid.; Briefing, subj: Striker, 28 Feb 97, Doc III-50; Fact Sheet, subj: HMMWV Based Observer Platform, 21 Mar 95, Doc III-51; Task Force XXI Final Report, Executive Summary, Oct 97, p. 9.

[33]Briefing, subj: Force XXI, 14 Apr 97, Doc III-52.

On a broader scale the Task Force XXI AWE furnished the Field Artillery School a glimpse of the future. After noting that the School was still sifting through the vast expanse of data generated by the AWE, General Baxter pointed out late in 1997, "Successes . . . showed that the fire support system is . . . capable of shaping battlespace and setting the conditions for decisive maneuver."[34] In fact, fires were critical for successful operations by setting the conditions for decisive maneuver by eliminating the enemy's capability to fight in a coherent manner.[35]

Subsequently, Task Force 2000 and the Field Artillery School participated in, observed, and analyzed the Division XXI AWE in November 1997 to validate Force XXI division design. Culminating the AWEs of the past several years and drawing upon the lessons from Task Force XXI AWE, the Division XXI AWE tested a force equipped with information-age battle command capabilities across the battlefield operating systems to determine the technological enhancements in lethality, survivability, and tempo and to validate organization, doctrine, tactics, techniques, and procedures, battle command, and combat service support concepts. Unlike the existing Army of Excellence Division that had seventy-two self-propelled 155-mm. howitzers and nine Multiple-Launch Rocket Systems (MLRS), Division XXI had three howitzer battalions (fifty-four cannons) and one MLRS battalion (eighteen) and was reinforced by two field artillery brigades that consisted of two MLRS battalions (fifty-four) and one howitzer battalion (eighteen).[36]

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[34]Baxter, "Honing the Edge", p. 1.

[35]Task Force XXI Final Report, Executive Summary, Oct 97, p. 8; Briefing, subj: Task Force 2000 in Support of AWE, Feb 98; Baxter, "Honing the Edge," p. 1; Briefing, subj: Force XXI, 14 Apr 97. For additional reading on Task Force XXI see: GEN William W. Hartzog and Susan Canedy, "Laying the Foundations: From Army XXI to Army After Next," Army, Feb 98, pp. 18-21, Doc III-53; Dennis Steele, "Task Force XXI Advanced Warfighting Experiment at NTC," Army, May 97, pp. 14-22, Doc III-54; and Dennis Steele, "AWE: Testing Soldiers and Equipment," Army, Jun 97, pp. 26-38, Doc III-55.

[36]Briefing, subj: Task Force 2000 in Support of AWE, Feb 98; Fact Sheet, subj: Division XXI AWE, 1 Jul 96, Doc III-56; TRADOC Pamphlet 525-71, Force XXI Division Operations Concept, 13 May 96, Doc III-57; Briefing, subj: Improving the Interim Division Design, undated, Doc III-58; Study Plan for Division XXI AWE (Extract), Oct 96, p. 1, Doc III-59; Briefing, subj: Proposed Force XXI Division Design, 26 Feb 96, Doc III-60; Briefing, subj: Corps Artillery FA Brigade, undated, Doc III-61; Briefing, subj: Force XXI,

undated, Doc III-62; Briefing, subj: Organization Charts Division XXI, 1997, Doc III-63; Briefing, subj: Army's First Digitized Division, undated, Doc III-64; Briefing (Extract), subj: Joint Venture Videoteleconference, 27 May 97, Doc III-65; COL David P. Valcourt and LTC Lester C. Jauron, "Division Redesign: Fires for Force XXI," Field Artillery, Jul-Aug 97, p. 24, Doc III-66.

For the Field Artillery specifically, tentative lessons emerged quickly from the Division XXI AWE and its preceding simulation exercises. On a general note Task Force 2000 and the Field Artillery School learned that situational awareness caused by digitization allowed the division to cover the battle space of a current corps. Moreover, the division had the ability to shape its battle space through attack helicopters, close air support, and field artillery and set the conditions for decisive operations. At the same time Division AWE fire support initiatives -- Brilliant Antitank and Search and Destroy Armor munitions, Crusader self-propelled 155-mm. howitzer, Firefinder Q-37 Block II radar, and M270A1 MLRS launcher -- provided seamless coverage of the division battle space, while the two field artillery brigades supporting the committed division were essential for rapidly satisfying a wide-range of tasks throughout an expanded battle space. Also, innovative tactics, techniques, and procedures for sensors and automation enabled successful proactive counterfire (killing enemy fire support systems before they fired) and freed assets for the close fight. Ultimately, the division AWE showed that fires could pave the way for decisive maneuver by killing armor. Only the final report, which was due to be published sometime in 1998, would provide the final lessons from the Division XXI AWE.[37]

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[37]Memorandum for See Distribution, subj: Division XXI AWE and First Digital Division Fielding Taskers, 22 Apr 97, Doc III-67; Briefing, subj: Improving the Interim Division Design: Adjusting for Task Force XXI, undated; Briefing, subj: Fires: The Cutting Edge, undated, Doc III-68; Briefing, subj: Force XXI, 29 Apr 97; Briefing, subj: Task Force 2000 in Support of AWE, Feb 98; Interview, Dastrup with MAJ Henry J. Hester, Jr., and MAJ Dean Mengel, Task Force 2000, 30 Jan 98, Doc III-69; Memorandum for Major Dean Mengel, subj: 1997 USAFACFS ACH, 12 Feb 98, Doc III-70; Fact Sheet, subj: Division XXI AWE Insights, undated, in Senior Fire Support Conference Packet, 9-13 Feb 98, Doc III-

13.

DEPTH AND SIMULTANEOUS ATTACK BATTLE LABORATORY

Training Fire Support Skills with Infoscope Technology Versus Guard Armory Device Full-Crew Interactive System Trainer (GUARDFIST II)

Late in 1997, budget restraints that were limiting the use of GUARDFIST II to train forward observers prompted the U.S. Army Field Artillery School to determine if Infoscope technology would be suitable. A canteen-sized computer worn by the user that could be employed with binoculars, missile launch sights, Abrams/Bradley system sights, and other systems, Infoscope technology received data by wireless communications and graphically injected entities generated by simulations into the viewer's visual field. This gave the user the ability to "see" threat elements and conduct reconnaissance displayed over actual terrain. Infoscope technology would permit playing deep or rear threats, would overcome maneuver constraints near environmentally protected areas, would provide realism for leaders and reconnaissance elements at all levels, and permit reconnaissance operations by light and special operations elements. As planned in 1997, the experiments scheduled for 1998 would compare training the same tasks with GUARDFIST II and Infoscope technology. This would lead to recommendations for employing the technologies.[38]

Voice Recognition for the Advanced Field Artillery Tactical Data System

In December 1997 the Depth and Simultaneous Attack Battle Laboratory initiated a project to determine the feasibility of employing speech recognition, activation, and synthesis to speech-enable existing forward observer and light unit field artillery systems. The laboratory planned to develop an initial concept for speech enabling a forward observer or light unit to show how the latest speech enabling technology

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[38]Fact Sheet, subj: Training Fire Support Skills with Infoscope Technology Versus GUARDFIST II/IIA, 8 Jan 98, Doc III-71.

with Army application hardware and software could be implemented.[39]

Battlefield Coordination Detachment Initiative

[39]Fact Sheet, subj: Voice Recognition Technology for AFATDS, 19 Dec 97, Doc III-72.

In November 1995 the Chiefs of Staff of the Army and Air Force signed a memorandum of agreement reinforcing the liaison support between the two services. In response to the memorandum, the Chief of Staff of the Army directed the U.S. Army Field Artillery School to improve the Battlefield Coordination Detachment's (BCD) capabilities. The BCD was the Joint Force Land Component Commander's representative to the Joint Air Force Command Component to synchronize air and ground battles. The BCD initiative would provide the Army Battle Command System (ABCS) systems that would enhance the Army's ability to incorporate operational requirements into the air tasking order development process. The ABCS systems would also furnish improved automation tools through digitization to help interpret the ground war for the Joint Force Air Component Commander. Ultimately, this involved digitizing 1st BCD, 2nd BCD in the U.S. Army Reserves, the Korea BCD, and the U.S. Army, Europe BCD to provide a seamless interface between the Army Force Commander and the Joint Force Air Component Commander. With equipment testing completed in 1997, fielding the four BCDs would occur in 1998.[40]

Theater Precision Strike Operations Advanced Concept Technology Demonstration

On 21 November 1997 the Department of Defense approved Theater Precision Strike Operations Advanced Concept Technology Demonstration as a new start for Fiscal Year 1998 that would run for six years in response to the Joint Forces Land Component Commander's requirement for an enhanced capability to conduct theater precision engagements and fires. In exercises planned for Fiscal Years 1999, 2000, and 2001, the demonstration would exercise and evaluate existing and emerging technology on a synthetic battlefield that would incorporate live, virtual, and constructive simulations. At the same time the demonstration would provide emerging leave behind capabilities with US forces in the United States and Korea.[41]

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[40]Fact Sheet, subj: BCD Initiative, 12 Jan 98, Doc III-73. See 1994 USAFACFS ACH, pp. 111-14, on background on the BCD.

[41]Fact Sheet, subj: Theater Precision Strike Operations, 7 Jan 98, Doc III-74; Fact Sheet, subj: Theater Precision Strike Operations, 16 Jan 98, Doc III-75.

AN/TPQ-37 Selectable Weapons Locating Modes Advanced Concepts and Technology Program

In 1997 the U.S. Army Field Artillery School envisioned constantly changing mission scenarios on the Force XXI battlefield that had to be countered with minimal assets. Threat forces would range from small bands of insurgents to major military powers and would be equipped with weapons varying from obsolete to state of the art. To meet this threat the Army required versatile systems that were not dedicated to specialized tasks.[42]

As of 1997, the AN/TPQ-37 Weapon Locating Radar System failed to meet the desired characteristics. It was optimized for the mid- to long-range artillery threat with mortar and rockets being considered secondary and had the primary mission locating the hostile artillery fires and forwarding the information collected to counterfire or intelligence personnel through the Advanced Field Artillery Tactical Data System (AFATDS).[43]

In view of this, the Field Artillery School initiated a project to optimize the Q-37 so that it could locate a wider variety of hostile weapons accurately. As planned in 1997, the project would provide operator selectable sub-modes of operation that would allow the deployment of an AN/TPQ-37 for selected missions where an AN/TPQ-36 and an AN/TPQ-37 would have been required or where an AN/TPQ-37 was already deployed. This would make the Q-37 more versatile, less dedicated to specialized tasks, and more suitable to future battlefields.[44]

Assessment of Crusader Operational Concepts for Digitized Battlefield Operations

In 1997 the Depth and Simultaneous Attack Battle Laboratory participated in tests to assess operational concepts for the employment of the Crusader self-propelled 155-mm. howitzer. Equipped with the Advanced Field Artillery Tactical Data System (AFATDS), participants, formed into a field artillery battle staff, performed critical fire support tasks for a brigade-level operation and fought tactical engagements on a synthetic battlefield developed by the Depth and Simultaneous Attack Battle Laboratory. Participants collected performance data and insights about tactics, techniques, and procedures to refine and update the Crusader System Operational Concept Document.[45]

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[42]Fact Sheet, subj: AN/TPQ-37 Selectable Weapon Locating Modes ACT II Project, 18 Dec 97, Doc III-76.

[43]Ibid.

[44]Ibid.

[45]Fact Sheet, subj: Assessment of Crusader Operational Concepts for Digitized Battlefield Operations II, 7 Jan 98, Doc III-77; Fact Sheet, subj: Assessment of Crusader Operational Concepts for Digitized Battlefield Operations

Classroom XXI -- Simulation and Automation in the Classroom

III, 7 Jan 98, Doc III-78.

In the near future the U.S. Army Field Artillery School planned to export about sixty percent of its training as distance learning. Because officer advanced training was the most difficult export effectively, some of it would most likely remain residential at Fort Sill. In response to this, the Army Research Laboratory and the Depth and Simultaneous Attack Battle Laboratory developed a project in 1997 to analyze new methods, media, and instructional objectives to determine if they met the goals and objectives to train advance course officers. Tentative conclusions indicated that simulation capabilities needed to be exploited more fully, that more technology in the classroom would not produce student-centered learning, support new learning goals, such as information processing, perceptual agility, and time compressed decision-making skills, and that an instructional strategy had to be devised to incorporate cutting edge instructional design to maximize existing and emerging technology.[46]

Enhancing Fire Support Simulation at the National Training Center

In 1997 the National Training Center (NTC) at Fort Irwin, California, depended upon the Multiple Integrated Laser Engagement System (MILES) coupled with the vehicle location and reporting system and the Central Instrumentation Systems (CIS) as the technical foundation upon which it was built. Although MILES was well-adapted for simulating line-of-sight weapon systems, such as rifles and tanks, it could not simulate non-line-of-sight systems, such as mortars, field artillery, and certain kinds of air-delivered ordnance. In light of this, the Center adopted the Simulated Weapons Effects/MILES (SAWE/MILES II) system to supplement MILES. However, SAWE/MILES II had problems with accuracy, responsiveness, and growth potential.[47]

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[46]Fact Sheet, subj; Classroom XXI -- Simulation and Automation in the Classroom, 8 Jan 98, Doc III-79.

[47]Fact Sheet, subj: Enhance Fire Support Simulation at NTC, 23 Dec 97, Doc III-80.

This encouraged the Army to search for an alternative based upon Distributed Interactive Simulation (DIS) technology. Upon receiving approval from the Commanding General at the NTC, the Depth and Simultaneous Attack Battle Laboratory started implementing a DIS-based Battle Damage Assessment (BDA) system and automatic radar stimulation system late in 1997 to meet the need. The Laboratory planned to create and test an interface between the Center's CIS and a DIS synthetic environment. The synthetic environment would contain fire support simulation and battle damage assessment models, incorporate locations of live vehicles on the NTC ranges, and contain artillery projectile flyout and delivery models that would provide high resolution of artillery effects on the synthetic battlefield. High-resolution battle damage assessment models would use the distribution of artillery effects and the locations of live vehicles to calculate predicted damage and suppression of live vehicles. This information would be fed back to the CIS for transmission to actual vehicles. A DIS compliant counterfire radar simulation would also interface with the Collective Training System Radar Controller so that the AN/TPQ-36 counterfire radar could be simulated in the synthetic environment.[48]

SENSE-AND-DESTROY-ARMOR MUNITION

Early in the 1970s, the Army projected that the Warsaw Pact's future armored forces would be sophisticated. The Pact's combat formations would be composed of mixes of maneuver and armored vehicles, field artillery, logistical units, and command and control elements. Equally important, the Warsaw Pact would have the capability of employing highly technical target acquisition and electronic countermeasure devices.[49]

To offset the enemy's numerical superiority, the Army had to improve its fire support. The Army could increase the number of weapons, but manpower and monetary constraints discouraged taking this course of action. After further consideration the Army turned to upgrading training and technology as a means of enhancing fire support because they would exploit current and future resources more efficiently. As a vital part of enhancing fire support that included introducing new weapons, target acquisition systems, command and control systems, support systems, and doctrine, the Army initiated action to develop smart munitions (precision munitions) that would be steered to the target and that would be more deadly than existing conventional high-explosive fragmentation projectiles.[50]

Besides introducing the Copperhead projectile, which

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[48]Ibid.

[49]1994 USAFACFS ACH, pp. 120-21.

[50]Ibid., p. 121.

required a laser designator to guide it to a target, the Army started work to on the Sense-and-Destroy Armor (SADARM) munition, a fire-and-forget precision munition, at the beginning of the 1980s to counter enemy armor. The projectile would be delivered over the target where it would dispense submunitions that would orient, stabilize, and descend by parachute in a controlled spin, searching a circular area with a diameter of approximately 135 meters. When a submunition's infrared, active and passive millimeter wave sensors confirmed a target, the submunition's warhead would fire a self-forging tantalum penetrator to destroy the target upon impact.[51]

[51]Memorandum for Record, subj: SADARM Submission to FY 1997 U.S. Army Tank and Automotive Command Annual Command History, 27 Jan 98, 26 Mar 98, Doc III-81; 1996 USAFACFS ACH, pp. 100-01.

After several years of development on the 155-mm. SADARM, the Army conducted technical testing in 1993 to determine if low-rate production could begin during the fourth quarter of Fiscal Year (FY) 1993. Based upon expected technical performance, the Army established a criteria of twenty-four hits from seventy-two submunitions. If SADARM met the effectiveness criteria, production would begin. However, technical difficulties during the June 1993 performance test led to a high dud rate and an insufficient number of hits (nine hits from seventy-two submunitions). As a consequence, serious questions were raised about the munition's reliability. The unexpected poor performance compelled the Army to halt the test and cancel the Army System Acquisition Review Council (ASARC) and Defense Acquisition Board (DAB). In the meantime, the Multiple-Launch Rocket System (MLRS) SADARM experienced expulsion problems and an excessive number of duds.[52]

In view of the difficulties, the Army restructured the SADARM program and simultaneously encountered confusing guidance from Congress. In September 1993 the Army Acquisition Executive approved a proposal by the SADARM Program Manager to fix the problems and test the munition again, which meant increasing the time to develop the munition. Meanwhile, a joint Senate and House Appropriations Committee appropriated money in FY 1994 to terminate the SADARM program, while a joint Senate and House Authorizations Committee authorized money to conduct further analysis for a 155-mm. SADARM only. Based upon legal guidance, the Army directed the SADARM Program Manager to continue work on the munition, although confusion over the direction that the program should go existed.[53]

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[52]1995 USAFACFS ACH, pp. 103-04.

[53]Ibid. pp. 104-05.

Intensive efforts by the SADARM Program Manager and the contractor corrected the technical problems. During technical tests in April 1994, the munition scored eleven hits and eight near misses from the thirteen projectiles (twenty-six submunitions) fired. This success demonstrated that SADARM was technically mature and reliable as it approached the low-rate production decision in the second quarter of FY 1995.[54] The Chief of the Munitions Branch, TRADOC System Manager (TSM) Cannon, Directorate of Combat Developments (DCD), U.S. Army Field Artillery School, explained the importance of the accomplishments of 1994. Early in March 1995, he pointed out that the Program Manager's and the contractor's work brought the 155-mm. SADARM "back from the dead."[55]

Based on the Congressionally-directed Smart Munition Study conducted by the Field Artillery School in 1994, the Army, in the meantime, stopped all work on the MLRS variant of SADARM. Although the study reaffirmed the need for a field artillery smart munition, numerous alternatives existed for the MLRS variant, such as the Brilliant Antiarmor Preplanned Product Improved (BAT P3I) submunition. The final decision to defer work on the MLRS submunition was based on a follow-on study entitled, MLRS Smart Tactical Rocket Study. However, the study concluded that there were not any viable alternatives to the 155-mm. SADARM.[56]

In the October 1994 Field Artillery, (formerly called the Field Artillery Journal until mid-1987) the Chief of the Munitions Branch clearly outlined the rationale for SADARM. He pointed out that the munition was a day-night, fire-and-forget, top-attack munition that would add a new dimension to "fighting with fires" and would dramatically enhance the Army's force projection. Years of engineering had produced a munition that was more lethal than high-explosive or dual-purpose improved conventional munitions and that was easier to employ than the Copperhead precision munition. In fact, gun crews could handle SADARM like any other 155-mm. projectile. Thus, at the end of 1994, the SADARM program was poised for Department of Defense approval to enter low-rate initial production.[57]

Early in 1995, three separate decisions led to low-rate initial production. Based upon the munition's performance during the testing of April 1994 and the ASARC review of December 1994, on 13 January 1995 the Army Acquisition Executive, Gilbert F. Decker, approved the SADARM program to proceed to the Defense Acquisition Board (DAB). However, he

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[54]Ibid., p. 105.

[55]Ibid.

[56]Ibid., pp. 105-06.

[57]Ibid., p. 106.

requested that the Program Manager pursue cost-reduction efforts to save the government money. On 30 March 1995 the DAB conducted a low-rate production review of the SADARM program. In view of the ASARC's decision and the Joint Requirement Oversight Council's validation of key performance parameters on 16 February 1995, the DAB approved entry into low-rate, initial production. Likewise, the ASARC directed restructuring the program to reduce costs.[58]

[58]Memorandum for Record, subj: SADARM Submission to FY 1997 U.S. Army Tank and Automotive Command Annual Command History, 27 Jan 98, 26 Mar 98; 1996 USAFACFS ACH, p. 104.

Notwithstanding the decision to move into initial low-rate production, the Army and contractor still had one major concern with the performance of SADARM. During testing, the submunitions often collided after being ejected from the carrier projectile. To fix the shortcoming the contractor developed a belleville spring to separate the submunitions when they were ejected. Although subsystem testing in the summer and fall of 1995 demonstrated that the spring functioned properly, the Field Artillery School and contractor were waiting official recognition at the end of 1995 that the shortcoming had been fixed.[59]

Tests in 1996 and 1997 validated the improvements to SADARM. In April and May 1996 during Engineering and Verification Tests at Yuma Proving Ground, Arizona, SADARM produced eight hits from nine projectiles. Subsequently, SADARM first-article testing at Yuma Proving Ground in December 1996 yielded five hits from four projectiles. During Initial Production Tests in the summer and early winter of 1997 at Yuma Proving Ground and the Cold Regions Test Center, Alaska, SADARM's performance exceeded the Army's expectations to permit moving into operational testing in mid-1998. As such, SADARM continued moving towards its ASARC scheduled for December 1998.[60]

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[59]1995 USAFACFS ACH, pp. 106-07.

[60]1996 USAFACFS ACH, p. 105; Memorandum for Record, subj: SADARM Submission to FY 1997 U.S. Army Tank and Automotive Command Annual Command History, 27 Jan 98, 26 Mar 98; Briefing, subj: SADARM Initial Production Testing,

1997, Doc III-82; Memorandum for Richard McKean, TSM Cannon, subj: 1997 USAFACFS Annual Command History, 27 Mar 98, Doc III-82A.

Initially part of an ambitious acquisition program in the 1980s aimed at reducing procurement and sustainment costs by introducing a family of armored vehicles mounted on a common chassis, the Crusader, a self-propelled 155-mm. howitzer, and its resupply vehicle promised to revolutionize cannon field artillery. Even though studies conducted late in the 1970s and early in the 1980s recognized the need for Crusader, the U.S. Army Field Artillery School (USAFAS) revalidated the requirement for the howitzer and its resupply vehicle in the 1990s. According to TRADOC System Manager (TSM), Cannon, the system would give the Army a dynamic warfighting capability. The M109A2/A3 self-propelled 155-mm. howitzer and its successor, the M109A6 Paladin self-propelled 155-mm. lacked sufficient mobility, survivability, lethality, and effectiveness for combat in the twenty-first century. In all areas of concern, Crusader exceeded the capabilities of the other two significantly.[61]

As demonstrated by Operation Desert Storm early in 1991, moreover, the Army critically required a new field artillery system to replace the M109A2/A3, and the Paladin that was scheduled to be fielded shortly would provide only a temporary solution. Of the three combat arms (Infantry, Field Artillery, and Armor), the Field Artillery had the most obsolete systems. Yet, the Armored Systems Modernization program as it was structured through mid-1991 made Crusader the fourth priority behind the Block III tank, the Future Infantry Fighting Vehicle, and the Combat Mobility Vehicle.[62]

In view of this incongruity with reality, a General Accounting Office (GAO) report and the Senate Armed Services Committee's Fiscal Year (FY) 1992 budget report severely questioned the Army's priorities. Pressured by the General Accounting Office's report and the Senate Armed Services Committee, the Army revamped its Armored System Modernization program. On 30 October 1991 the Army sent Congress a position paper. The Army deferred further development on the Block III Tank, the Future Infantry Fighting Vehicle, and the Combat Mobility Vehicle. Options to resume development on the systems would be left open to meet the threat, while key components -- cannon research and engine development -- would

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[61]1995 USAFACFS ACH, pp. 113-14. To minimize confusion the name "Crusader" will be used when referring to the howitzer and its resupply vehicle. Through the early 1990s, the Crusader was called the Advanced Field Artillery System and the resupply vehicle was called the Future Armored Artillery Resupply Vehicle. Both were separate programs. See Paul F. Pearson's and Glenn K. Otis's "Crusader: Linchpin of the Force XXI Army," Army, Nov 96, pp. 45-47, for an interesting discussion about the rationale for Crusader by two retired Army officers.

[62]1995 USAFACFS ACH, p. 114.

be retained in the technology base for continued development.[63]

[63]Ibid., pp. 114-15.

Unlike the earlier decision to make the Block III tank the number one priority, the Army made Crusader with its resupply vehicle, formerly known as the Future Armored Resupply Vehicle, the lead Armored System Modernization projects and decided that they would be developed concurrently. At the same time the Army abandoned the strategy of adopting a common chassis for armored systems that had been the focal point in its modernization effort since the mid-1980s. Only commonality between Crusader and its resupply vehicle remained. Furthermore, development on Crusader after late-1991 focused on testing technologies to validate their maturity and utility to reduce the risk of introducing unsuitable technology. This meant developing the gun, propellant, and field artillery modules to be mounted on the chassis.[64]

Meanwhile, work on the propellant moved forward. In September 1991 the General Officer Steering Committee (GOSC), chaired by Major General Richard D. Beltson and Brigadier General James J. Cravens, Jr., reviewed the firing and analytical test data for Unicharge and liquid propellant. Based upon liquid propellant's growth potential, its ability to achieve the required rate of fire and range, its capability of being supported more easily logistically, and its life cycle costs, the committee picked it for Crusader. However, additional testing and analysis would be required before final design work could proceed. Although it chose liquid propellant, the committee recommended continuing work with Unicharge as a backup to satisfy the requirements of Crusader if needed and to meet the requirements of current weapon systems.[65]

The Assistant Secretary of the Army for Research, Development, and Acquisition, Stephen K. Conver, followed up on the committee's recommendations. Early in November 1991, he directed the Program Executive Officer, Armored Systems Modernization, to continue development of liquid propellant and the next-generation regenerative liquid propellant gun for Crusader. Some within the Army considered the propellant to be a risky choice because it had not been completely developed and could be expensive. At the same time Mr. Conver tasked the Program Executive Officer (PEO) to continue work on Unicharge at a minimum level of effort that was consistent

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[64]Ibid.

[65]1996 USAFACFS ACH, p. 108.

with current funding. The focus of this was to identify and resolve the critical technical and engineering issues related to the application of Unicharge propellant to Crusader.[66]

[66]Ibid., pp. 108-09.

Work on liquid propellant and regenerative liquid propellant gun demonstrated promise. Early in 1992, testing of liquid propellant by firing fifty-two rounds at the Army's Yuma Proving Ground, Arizona, produced favorable results. Employed in a 155-mm. brassboard gun, which was essentially a laboratory gun to prove the capabilities of the technology, liquid propellant fired a rocket assisted projectile 44.4 kilometers to surpass the requirement by 4.4 kilometers and an unassisted projectile 33.2 kilometers to clear the requirement by 3.2 kilometers. In addition to the increased range, the propellant was more accurate, safer, and less expensive than existing propellants. In August 1993 the regenerative liquid propellant gun, a critical component of Crusader, fired a three-round burst of fire. This represented a key technological breakthrough and indicated that the gun and propellant could potentially satisfy the requirement for rapid fire and give the weapon the ability to fire a one-gun time-on-target.[67]

After several years of work, two critical problems with the propellant surfaced in 1995 that influenced the direction of the Crusader program. In the fall of the year, the Army realized that it required more money than it had to execute the demonstration and validation phase. Projected costs exceeded the money allocated, and obtaining additional funding required Congressional approval. As TSM Cannon explained, the costs of developing liquid propellant raised the affordability issue. The propellant was too expensive to develop in the demonstration and validation phase. To keep the work going the Army had to find an affordable proposal because the liquid propellant Crusader was unaffordable, and Unicharge presented a viable, cost-effective alternative.[68]

Chronic problems also plagued the development of liquid propellant. It decomposed rapidly, combusted easily in storage, was incompatible with some metals being used in Crusader's cannon system, and was corrosive. Along with the funding issue, the state of liquid propellant technology and a series of incidents with liquid propellant between 1991 and 1995, such as a fire caused by the propellant leaking from a storage tank, caused the Army to question the wisdom of developing the propellant and raised the possibility of employing solid propellant, Unicharge, which was renamed the

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[67]1995 USAFACFS ACH, p. 117.

[68]1996 USAFACFS ACH, p. 110.

Modular Artillery Charge System (MACS) in 1995.[69]

[69]Ibid., pp. 110-11.

In light of the affordability and technological issues, the Army conducted a rigorous comparison of liquid propellant and MACS in 1995. Both propellants met user requirements, and the operational performance differences between the two propellants were minimal. Regardless of the propellant, Crusader performed much better than the Paladin and would make the field artillery force more lethal, survivable, and mobile to satisfy the requirements of the twenty-first century. Considering that the MACS Crusader met all of the critical user needs and was less expensive than liquid propellant and that liquid propellant required further costly and extensive technological work before it would be employable, the Field Artillery School recommended late in 1995 employing MACS in the Crusader. A MACS Crusader was affordable and operationally effective and not a high risk technology like liquid propellant. Given this, the Field Artillery School strongly urged the Army to change to solid propellant for the Crusader.[70]

In 1996 the Army made the decision about the propellant. In a memorandum on 15 March 1996, the Assistant Secretary of the Army for Research, Development, and Acquisition, Gilbert F. Decker, wrote, "Troubling and persistent technical problems, programmatic risk, and growing concerns about affordability [with liquid propellant] have caused us [the Army] to reassess the prudence of continuing with liquid propellant for Crusader."[71] Mr. Decker then directed establishing solid propellant as the propellant of choice for the Crusader and restructuring the current Crusader program. The Army had to incorporate the change to solid propellant into the existing contract and execute the most cost-effective demonstration and validation contract. Equally important, the decision permitted staying within the budget.[72]

In the meantime, USAFAS confronted the issue of examining alternatives self-propelled 155-mm. howitzers to the Crusader. In January 1995 the Milestone I Acquisition Decision Memorandum for Crusader, written by the Office of the Secretary of Defense, required the Army to evaluate foreign

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[70]Ibid., pp. 111-12.

[71]Ibid., p. 112.

[72]Ibid.

systems, specifically the German PzH2000 self-propelled 155-mm. howitzer, to gain a better appreciation of the Crusader. Subsequently, in November 1995 the Army tasked the Project Manager for Crusader to determine if the PzH2000 met the requirements for Crusader.[73]

[73]Ibid., pp. 112-13.

This assignment led to a series of meetings in 1996 with the prime German contractor, Wegmann GmBH, and the German army, who were seeking potential foreign buyers. In May 1996 the Assistant Secretary of the Army for Research, Development, and Acquisition, Herbert K. Fallin, Jr., directed the Army to conduct a two-phase investigation to determine if the PzH2000 could be used as a Crusader. While Phase I, called the "quick look assessment," would provide a benchmark for future analysis, Phase II would be an in-depth analysis of the howitzer. Subsequent to Mr. Fallin's tasking, a team from the Directorate of Combat Developments, USAFAS, visited Germany late in June 1996 for a "quick look" assessment of the PzH2000. Although discussions with the Germans at that time disclosed significant differences between American and German methods of collecting data, one team member concluded, "The PzH2000 is a very capable system that meets the needs of the German army."[74] The visit also revealed that howitzer could be modified to meet some Crusader requirements but that it could not meet all of them. For example, the PzH2000 did not have a companion resupply vehicle; lacked a cannon cooling system that was required to provide continuous fire support to shape the battle and support surge and peak battle conditions; had a lower rate of fire; was less accurate; and had a five-person crew whereas the Crusader had a three-person crew.[75]

Although the Germans insisted that they could modify the howitzer to meet the Army's requirements, the Army still opposed adopting it. On 6 December 1996 Mr. Fallin explained, "There are two principal reasons why the PzH2000 as a system does not meet our Crusader Objectives."[76] First, the Crusader required a cooled cannon. Second, the reduction in operational costs in crew size from the Paladin to Crusader was imperative because of projected budgets. "Although it may be possible to grow the PzH2000 system to meet Crusader requirements," Mr. Fallin added, "the analyses that we have

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[74]Ibid., p. 114.

[75]Ibid., pp. 113-14.

[76]Ibid., p. 115.

shared with you suggest that this would not be the most efficient path to procure a system that meets our requirements."[77] Even so, the Army would still conduct a Phase II analysis in the near future to complement the Phase I analysis completed in 1996.[78]

[77]Ibid.

[78]Ibid.

One day later, Under Secretary of Defense, Dr. Paul G. Kaminiski, reaffirmed the Army's position. In a letter to the German Minister of Defense, Dr. Kaminiski recognized the possibility of cooperating with the Germans in developing the Army's next-generation howitzer. After hearing the advantages and disadvantages of working with the Germans and using the PzH2000, he wrote, "In the end, however, the issue became one of the rate of fire that each gun could achieve and sustain. Our Army is convinced that the requirement they have stated for a sustained rate of fire must be achieved."[79] Dr. Kaminiski then noted, "While there is a possibility the PzH can be modified to meet this same requirement, that kind of modification would be essentially a new and much different program that could not offer the research and development savings necessary to justify a decision to procure PzH2000."[80] Given the costs, Dr. Kaminiski declined the German offer of using the PzH2000. Notwithstanding this, the Army should retain the PzH2000 as a backup should the Crusader "encounter serious technical difficulties."[81]

In its report of June 1997, the General Accounting Office (GAO) reviewed the Crusader program to determine its status and the availability of an alternative, such as the PzH2000. After conducting extensive interviews with varying levels of Army command and private industry in 1996-97, the GAO concluded, "No existing artillery system meets all of the Crusader requirements."[82] Notwithstanding the favorable report, the GAO acknowledged that the Crusader program faced considerable programmatic risks. More specifically, the technical challenges faced in developing and integrating advanced technologies, the potential compression of the program's schedule of development, and the absence of defined criteria for entering into low-rate initial production and full-rate production could jeopardize fielding the system.[83] To minimize the risk of prematurely entering into production, the GAO report recommended that the Secretary of Defense should direct the Secretary of the Army to establish criteria specifying, at a minimum, that the Crusader system should demonstrate its ability to meet all key requirements, that it was on schedule for satisfying it reliability requirements before entering low-rate initial production, and that it was operationally effective and suitable before entering full-rate

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[79]Ibid., p. 116.

[80]Ibid.

[81]Ibid.

[82]GAO Report, Army Armored Systems, 6 Jun 97, pp. 10-13, Doc III-83.

[83]Ibid., p. 13.

production. If the requirements could not be met, an alternative system could be considered. This left open the option of adopting the PzH2000, but this was not a viable consideration as far as the Army was concerned because the German howitzer failed to meet its needs.[84]

[84]Ibid., pp. 10, 13.

Shortly afterwards, an article in Defense Daily on 21 October 1997 came to the defense of the German howitzer. It argued that the German PzH2000 would meet the needs of the Army after being improved and would be a less expensive than the Crusader. In a series of meetings and briefings during the remaining months of 1997 with congressional staffers, the Army addressed the article's contentions. Among other things, the Army pointed out that the PzH2000 would not provide revolutionary technology to support the force well into the next century, that PzH2000 modifications would still fall short of the Crusader's, and that they would not provide savings. In fact, the PzH2000 was essentially a 1990 howitzer with serious mission deficiencies that precluded consideration. The howitzer was heavy, lacked automated loading capabilities, and was still to a great extent a manual system. Ultimately, the PzH2000 failed to meet Crusader requirements, nor could it meet them with the modifications. In view of this, as far as the Army was concerned, the Crusader remained the future howitzer of choice because it would have a state-of-the-art cockpit with embedded command and control that would permit the crew to fight the system to its maximum potential, would have a robust cannon that would not overheat, would have a reliable ammunition loading system, and would have a powerful engine to keep the field artillery force up with the maneuver forces. From the Army's perspective based upon research, the Crusader would last at least forty years.[85]

In a briefing given at the direction of the Office of the Deputy Chief of Staff for Operations and Plans on 2 October 1997, the Project Manager for Crusader and the TSM Cannon from Fort Sill continued the effort to defend Crusader from its detractors. They pointed out that Paladin was a success story, but it was manpower intensive, lacked sufficient lethality, lacked the mobility of the supported force, and was a survivability risk. The Army simply required a more lethal, mobile, and survivable cannon system to meet the needs of the future because the Paladin would not be able to support Army XXI or the Army After Next. Equally important, the existing method of developing the system was cost effective and innovative to ensure that the Crusader satisfied the user's requirements at the best possible price in light of budget cuts.[86]

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[85]Ibid., pp. 10-13, Doc III-; Msg with Encls, subj: Crusader, 15 Aug 97, Doc III-84; Talking Paper, subj: PZH2000 Discussion with John Barnes, 17 Nov 97, 6 Nov 97, Doc III-85; Msg, subj: Talking Points for Barnes, 14 Nov 97, Doc III-86; Briefing, subj: Response to Defense Daily Article, 17 Nov 97, Doc III-87; Briefing, subj: Crusader: The Army XXI Firepower Revolution, 1997, Doc III-88.

[86]Briefing, subj: Crusader 2-Start Review of Requirements and Cost, undated, Doc III-89; Briefing, subj:

Crusader 2-Start Review of Requirements and Cost, undated, Doc III-90; Memo with Encls, 20 Oct 97, Doc III-91; Memorandum for Record, subj: Requirements for IIPT, 24 Apr 97, Doc III-92.

About the same time as the briefing, the National Defense Panel questioned the rationale for the system in light of funding restraints and even urged reducing the number of Crusaders to be produced. This proposal caused the Commandant of the Field Artillery School, Major General Leo J. Baxter, to come to the defense of the system. In letters to members of the panel, General Baxter explained, "Crusader is a world-class artillery system for the 21st century. . . . As the Chief of Field Artillery, I am somewhat in awe of Crusader's potential. It is a revolutionary fire support platform."[87] Although a direct impact of the letters was not felt in 1997, they represented a part of the Army's and the School's effort to sell the Crusader and avert possible elimination of the system, given the budget situation.[88]

Just as budgetary considerations raised the specter of finding a less expensive alternative weapon system or reducing the number of Crusaders to be developed and modifying the Acquisition Program Baseline schedule, they also drove a reconsideration of the system's design. A "Gray Matter Team" composed of the TRADOC System Manager, the Project Manager for Crusader, and the contractor met several times over a period of several months in 1997 to review the system's requirements, the state of development, and the program objectives and to recommend the optimum balance of cost, weight, and performance parameters. Based upon their findings, the team's recommendations urged adjusting the requirements to ensure system growth and cost effectiveness in an era of budgetary constraints and led to changes in the Operational Requirement Document. As the team's work suggested, funding lay at the heart of Crusader issues in 1997. Notwithstanding threats to the system caused by budget cuts, a System Level Review, held on 16-18 December 1997, verified that development was moving forward as scheduled.[89]

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[87]Msg with Encls, subj: Meeting with GEN (R) Riscassi, 2 Oct 97, Doc III-93. This message contains as enclosures the letters that General Baxter sent to National Defense Panel members explaining the revolutionary status of the Crusader, trying to win their support and prevent funding reductions.

[88]Msg with Encls, subj: Meeting with GEN (R) Riscassi, 2 Oct 97; Interview, Dastrup with Maj Brown, TSM Cannon, 20 Feb 98, Doc III-94.

[89]Msg with Encls, subj: Crusader OIPT EXSUM, 3 Oct 97, Doc III-95; Briefing, subj: Executive Management Outbrief of the Crusader, 28 Aug 97, Doc III-96; Briefing, subj: Gray Matter Team Briefing to the Executive Management, 28 Aug 97, Doc III-97; Briefing, subj: Disposition of Gray Matter Team Recommendations, undated, Doc III-98; Memorandum with Encls for PM Crusader, subj: Crusader Operational

Requirements Document Changes as a Result of the Gray Matter Team Process, 24 Oct 97, Doc III-99; Memorandum for Record, subj: none, 24 Apr 97.

LIGHTWEIGHT TOWED 155-MM. HOWITZER

When the United States shifted its national defense priorities from forward-deployed forces in Europe to force projection from the continental United States (CONUS) early in the 1990s when the Cold War ended, lightweight weapons attracted the Army's interest more than before. Lightweight weapons were more strategically and tactically deployable than heavier weapons. In view of the new world order and the drive for strategically deployable equipment, the Army wrote an Operational and Organizational Plan in 1991 for a lightweight towed 155-mm. howitzer, called the Advanced Towed Cannon System (ATCAS), to replace the aging M198 towed 155-mm. howitzer.[90]

To accomplish its mission of conducting expeditionary operations across the entire spectrum of conflict throughout the world, the U.S. Marine Corps, in the meantime, wrote a Joint Service Operational Requirement in 1989 for a lightweight, towed 155-mm. howitzer to provide close and long range fire support to the maneuver forces. At the time the Marine Corps employed the towed M101A1 105-mm. howitzer, which was adopted in 1939 and was 1920s technology, as a contingency weapon for certain missions because the M198 was too heavy. Although the M101A1 did not have the desired lethality and range, it provided the mobility needed by highly maneuverable ground forces in raid or rapid action scenarios. However, the weapon was only marginally supportable because of its age and maintainability. In light of this and new Department of Defense acquisition regulations, the Marine Corps replaced the Joint Service Operational Requirement of 1989 with an approved Mission Need Statement in May 1993 for a lightweight, towed 155-mm. howitzer to supplant the M198 and M101A1.[91]

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[90]1995 USAFACFS ACH, pp. 121-22.

[91]Ibid., pp. 122-23.

Given the common need for a lightweight towed 155-mm. howitzer, the Army and the Marine Corps joined forces. In October 1993 they signed a memorandum of agreement that outlined the system's desired characteristics. The howitzer would have a maximum weight of nine thousand pounds and a capability of firing rocket-assisted projectiles to a range of thirty kilometers. According to the memorandum, the Army would take the lead in defining the detailed requirements for the howitzer. This would be done through an early user-sponsored study to establish an analytical basis and cost effectiveness of the system, to evaluate the potential of existing lightweight 155-mm. howitzer prototypes that had been built by various contractors, and to explore labor-saving and tactical efficiencies possible through improved technologies. The study ultimately would lead to a refined, detailed statement of the joint requirement to allow the development of a Joint Operational Requirements Document.[92]

Meanwhile, the Field Artillery School wrote a draft Mission Need Statement for the Advanced Towed Cannon System, renamed the Lightweight 155-mm. Towed Howitzer in 1996 and XM777 in 1997, for the Army in 1993-94. Because the Army did not want a separate Mission Need Statement and because the Marine Corps Mission Need Statement adequately stated the basic requirements for the weight, range, and weapon capabilities that the Army needed, the U.S. Army Training and Doctrine Command (TRADOC) requested the U.S. Army Field Artillery School to explore endorsing the Marine Corps's Mission Need Statement or developing a joint Mission Need Statement with the Marine Corps.[93] Recognizing that the Marine Corps did not want to write a new Mission Need Statement and that the basic requirements for the howitzer were identical

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[92]Ibid., p. 123; Fact Sheet, subj: Lightweight 155 Howitzer (LW155/XM777), undated, in Senior Fire Support Conference Packet, 9-13 Feb 98, Doc III-100.

[93]1995 USAFACFS ACH, pp. 123-24; Fact Sheet, subj: LW 155/XM777, 25 Feb 98; Interview, Dastrup with John K. Yager, TSM Cannon, DCD, 25 Feb 98, Doc III-101.

for both services, in May 1994 the Field Artillery School recommended that the Army should adopt the Marine Corps's Mission Need Statement to simplify acquiring a new towed howitzer and sent the Statement to TRADOC.[94]

Upon approving the Statement in June 1994 after arriving at the same conclusions that the Field Artillery School had reached, TRADOC forwarded it to the Department of the Army. Based upon TRADOC's recommendation and a review of the Marine Corps's Mission Need Statement, in September 1994 the Department of the Army approved it for use and took the lead in developing the lightweight 155-mm. howitzer operational requirements document with support from the Marine Corps.[95]

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[94]1996 USAFACFS ACH, p. 124.

[95]Ibid., pp. 124-25.

Over the next eighteen months, key events with the system occurred. In February 1995 the Assistant Secretary of the Navy for Research, Development, and Acquisition approved moving the lightweight 155-mm. towed howitzer program into the Concept Exploration and Definition Phase and outlined the need for a shoot off between candidate 155-mm. systems. On 29 September 1995 the Army approved the Joint Operational Requirements Documents that outlined the system's characteristics. Five months later in February 1996, the Assistant Secretary of the Navy for Research, Development, and Acquisition sanctioned moving the program into the Engineering and Manufacturing Development phase (EMD).[96]

Although a joint program existed to produce a lightweight, towed 155-mm. howitzer for the Army and Marine Corps, one basic difference existed between the two services' objective system. Because the Marine Corps had an immediate requirement for a towed 155-mm. howitzer to replace the M198 and M101, it decided to field a howitzer without digitization capabilities. The Army's lightweight 155-mm towed howitzer, in comparison, would be fully digitized and introduced later than the Marine Corps's. However, the Marine Corps planned to digitize their lightweight 155-mm. towed howitzer through product improvement programs subsequent to fielding.[97]

Although the biggest obstacles to digitization were weight restrictions, power requirements, and the need to harden the automated systems to withstand weather and operational conditions, technology solved the problems. In 1996 modern electronics made possible an onboard computer with

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[96]Ibid., p. 125; Fact Sheet, subj: LW 155/XM777, 25 Feb 98; Fact Sheet, subj: LW155/XM777, undated, in Senior Fire Support Conference Packet, 9-13 Feb 98.

[97]1996 USAFACFS ACH, pp. 125-26.

an integrated radio modem and an onboard power supply. Linked with a single-channel ground and airborne radio system (SINCGARS), the computer would furnish rapid, secure communications to the fire direction center or platoon operations center and directly to target acquisition sources. Ultimately, the computer would improve responsiveness and increase accuracy, lethality, and survivability.[98]

[98]Ibid., p. 121.

In the meantime, the Joint Program Manager for the weapon system conducted a series of tests in 1996. Four contractors passed the initial screening criteria. They were Vickers Shipbuilding and Engineering Limited (VSEL), Royal Ordnance, Lockheed-Martin Defense Systems, and Lewis Machine and Tool Incorporated. In May 1996 Lewis Machine and Tool Incorporated was disqualified because its prototype had actually been constructed by a government arsenal. Subsequently, Lockheed-Martin Defense Systems dropped out of the tests because its prototype had too many technical difficulties to be competitive. By the time that testing had ended, only Vickers and Royal Ordnance remained in contention.[99]

Based upon the test results and the ability to meet development timelines and costs, the U.S. Government awarded the contract to the team of Vickers and Textron Marine and Land Systems for engineering, manufacturing, and development. Funded by the U.S. Marine Corps, the contract stipulated the delivery of eight nondigitized howitzers for operational testing in 1999. If the eight howitzers passed the tests conducted by the Marine Corps, production of 526 nondigitized howitzers for the Marine Corps would begin with a first unit to be equipped in 2002. Retrofitting them with digitized capabilities would come later. Subsequently, the Army would receive 273 digitized howitzers in 2005.[100]

ADVANCED TECHNOLOGY LIGHT ARTILLERY SYSTEM

In 1996 the Field Artillery began exploring in earnest the elimination of all 105-mm. howitzers currently used as direct support weapons for the light and special purposes forces for several reasons. First, the 105-mm. howitzer had only two types of munitions that enhanced weapon range and lethality. These munitions included the recently produced rocket assisted projectile, the M913, and the recently type-classified dual-purpose improved conventional munition, the M915. The munitions lacked sufficient killing power and required large expenditures of ammunition to achieve the desired effect upon targets. Second, the 105-mm. howitzer offered little opportunity to improve its overall combat effectiveness and as a weapons platform offered little or no growth potential for the future battlefield and would not

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[99]Ibid., pp. 121-22.

[100]Fact Sheet, subj: LW 155/XM777, 25 Feb 98; Interview, Dastrup with Yager, 25 Feb 98.

satisfy Army XXI requirements. Third, the 155-mm. howitzer fired a far broader family of munitions and had much greater effectiveness when compared to the 105-mm. howitzer shell. Fourth, technology had advanced to the point where it was feasible to produce a 155-mm. direct support weapon weighing very little more than the current 105-mm. direct support weapon, the M119A1 howitzer.[101]

[101]Msg, subj: Command History, 7 Apr 98, Doc III-101A.

In order to meet the need for a lightweight 155-mm howitzer for direct support missions in light or special forces, the Field Artillery School developed and staffed a mission need statement in conjunction with industry and other government agencies represented by the Integrated Concept Team. The U.S. Army Training and Doctrine Command (TRADOC) approved the mission need statement in October 1996 and forwarded it to the Department of the Army where it was assigned a Catalog of Approved Requirements Documents number. Funding was being addressed in the Program Objective Memorandum for Fiscal Year 2000-05.[102]

The Field Artillery School explained that the expected light weight of the Advanced Technology Light Artillery System, as the 155-mm. was called, would be achieved by employing two complementary recoil management means. First the system would employ soft recoil or fire out of battery techniques. In the soft recoil application the howitzer moved forward to achieve forward velocity. As this was occurring, the weapon would be fired. The recoil energy generated by the departing projectile had to overcome the forward motion of the tube before the tube would begin its rearward motion. This technique, although it was not new, would dissipate up to fifty percent of the recoil force in just overcoming the forward movement of the tube. Second, the system was being considered for the integration of electrorheological fluid technology into the weapon. Electrorheological fluids were liquids that had a particulate matter suspended within them. The fluids changed viscosity with the application of an electric current. The integration of electrorheological fluids would permit real time management (fine tuning) of the recoil force imparted to the cannon upon firing. Such management would occur in milliseconds because the application of electric current to the fluid would change the viscosity instantaneously. These combined technologies would result in a weapon platform of five thousand pound, which would be only eight hundred pounds heavier than the M119A1 howitzer.[103]

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[102] Ibid.

[103] Ibid.; Interview, Dastrup with Steve Johnson, Material Requirements and Integration Division, DCD, 2 Mar 98, Doc III-102; Memorandum for Steve Johnson, Material Requirements and Integration Division, DCD, subj: 1997 USAFACFS Annual Command History, 17 Mar 98, Doc III-103.

MULTIPLE-LAUNCH ROCKET SYSTEM

In 1997 improvement efforts with the Multiple-Launch Rocket System (MLRS) focused on enhancing the munitions to give them better range and precision and making the launcher more responsive. Although MLRS System performed well during Operation Desert Storm in 1991, its rockets and their submunitions raised serious concerns. During the war, many Iraqi artillery assets outranged their coalition counterparts, including MLRS. Also, the high dud rate of munitions, including MLRS submunitions, raised concerns about the safety of soldiers passing through impact areas. Together, the proliferation of rocket systems with ranges greater than MLRS and the dud rate led to the requirement for an extended-range (ER) MLRS rocket with a range of forty-five kilometers and with a lower submunition dud rate. Such a range would increase the commander's ability to influence the battlefield at depth and fire across boundaries and simultaneously would improve the survivability of launcher crews.[104]

In 1995 and 1996 testing revealed deficiencies with ER-MLRS. Although the self-destruct fuse was improved as indicated by tests in 1995 and although the required range was met, tests in 1996 disclosed that the dud rate was still too high. This caused the Army to develop a "get well plan" in April 1996 to enhance the self-destruct fuse and to conduct additional testing in 1997. Once the improved M85 dual-purpose improved convention munition grenade in the ER-MLRS rocket had demonstrated a reduced dud rate, the Army moved the rocket into low-rate initial production in 1997 with

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[104]1995 USAFACFS ACH, p. 126; John K. Yager and Jeffrey L. Froysland, "Improving the Effects of Fires with Precision Munitions," Field Artillery, Mar-Apr 97, pp. 5-7, Doc III-104. Also see "Extended Range for MLRS Rockets in the Works," Field Artillery, Apr 92, p. 39, Doc III-105. See Program Executive Office, Tactical Missiles, M270 Family of Munitions Modernization Plan (Extract), Feb 93, for additional information, Doc III-105A.

operational testing scheduled for Fiscal Year (FY) 1998 and fielding scheduled for FY 1999.[105]

[105]1996 USAFACFS ACH, p. 123; Yager and Froysland, "Improving the Effects of Fires with Precision Munitions," p. 6.

As the Army worked to introduce the ER-MLRS, it also decided to adopt an extended-range guided MLRS rocket. Writing in Army in September 1996, the Commandant of the Field Artillery School, Major General Randall L. Rigby, explained the reasoning behind the decision. In recent years the Army's ability to protect itself from long-distance attack had been eroded with the proliferation of long-range rocket and cannon systems. To counter this the U.S. Army Missile Command's Research, Development, and Engineering Center with support from industry initiated work on an extended-range guided rocket for the MLRS to replace ER-MLRS in the twenty-first century. Unlike the accuracy of the traditional free-flight MLRS rocket that degraded as the range to the target increased, the guided rocket would utilize a guidance system to provide consistent, improved accuracy from a minimum range of fifteen kilometers to a maximum of sixty to seventy kilometers to attack area and point targets. This would give the MLRS an additional fifteen kilometer range beyond the ER-MLRS. Such a range would permit hitting more targets, would make the MLRS more survivable because it could be positioned farther from the target, would require fewer rockets to neutralize a target, would reduce logistical requirements, and would enhance the Army's ability to conduct precision strikes.[106]

Meanwhile, the Army recognized the requirement to modernize the MLRS M270 launcher to meet the needs of the Army Tactical Missile System (ATACMS) Block IA that required the Global Positioning System (GPS) to be shot. In 1993 the Army determined that the ATACMS Block IA would receive its GPS initialization data directly from the launcher. Although the M270A1 MLRS launcher, scheduled for fielding in 2000, would have the capability, the Block IA missile would be fielded in 1998. In view of this, the Army decided to upgrade the existing M270 launcher by incorporating GPS navigation to create the Improved Positioning Determining System (IPDS) launcher that it could fire the ATACMS Block IA. Twenty-nine IPDS launchers would be fielded in 1998 with ten going to the C Battery, 6-37th Field Artillery in Korea and nineteen going to the 2-18th Field Artillery at Fort Sill.[107]

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[106]1996 USAFACFS ACH, pp. 123-24; Yager and Froysland, "Improving the Effects of Fire with Precision Munitions," pp. 5-7; Interview, Dastrup with Jeffrey L. Froysland, TSM RAMS, DCD, 2 Mar 98, Doc III-106.

[107]Fact Sheet, subj: IPDS Launcher, undated, Doc III-107; Scott R. Gourley, "Extending the Range of Rocket and Missile Systems," Army, Jun 95, pp. 36-42, Doc III-108; Interview, Dastrup with LTC Mark Wiley, TSM RAMS, DCD, 13 Feb 98, Doc III-109; MG Randall L. Rigby, "Mapping the Future: FA State of the Branch 1996," Field Artillery, Nov-Dec 96, p. 6, Doc III-110.

Around 2000 the Army intended to replace the basic M270 launcher with the M270A1 launcher that included two material changes to the basic M270: the Improved Fire Control System (IFCS) and the Improved Launcher Mechanical System (ILMS). Besides incorporating more and faster processors and increased memory/storage capabilities to reduce fire mission processing time and increasing processing capacity dramatically, the IFCS also would have the Global Positioning System (GPS) to enhance navigation. At the same time the ILMS would decrease firing time because it permitted elevating and traversing the launcher faster to give greatly improved responsiveness and survivability in conducting fire missions and reload operations.[108]

ARMY TACTICAL MISSILE SYSTEM AND BRILLIANT ANTIARMOR SUBMUNITION

[108]Scott R. Gourley, "Extending the Range of Rocket and Missile Systems," pp. 40, 42; BG Randall L. Rigby, "Fires for Division XXI: State of the Branch 1995," Field Artillery, Nov-Dec 95, p. 4, Doc III-111; Fact Sheet, subj: M270A1 MLRS, undated, Doc III-112; Interview, Dastrup with CPT Richard Howard, TSM RAMS, 13 Feb 98, Doc III-113.

After several years of full-scale engineering and development in the 1980s, the Army introduced the Army Tactical Missile System (ATACMS) early in the 1990s to meet the pressing requirement of attacking second-echelon forces. Mounted on a Multiple-Launch Rocket System (MLRS) M270 launcher, ATACMS was designed to engage "soft" stationary targets (air defense units; command, control, and communications; surface-to-surface missile units; logistical sites; and helicopter forward operating bases) at ranges of 25 to 165 kilometers by dispensing bomblets over the target. In September 1990 the first ATACMS-capable unit was fielded in Southwest Asia because of Operation Desert Shield of 1990 and not to Germany where it was initially scheduled to go. As combat operations in Operation Desert Storm by A Battery, 6th Battalion, 27th Field Artillery, 75th Field Artillery Brigade demonstrated, ATACMS, later renamed ATACMS Block I as new versions were introduced, gave the Army its first real deep attack capabilities with a conventional weapon to support AirLand Battle.[109] Ultimately, Lockheed Martin Vought Systems of Grand Prairie, Texas, produced approximately fifteen hundred missiles by FY 1997.[110]

Operational considerations in 1991-92, in the meantime, raised the necessity of an extended-range ATACMS. Concerned about deficiencies in theater missile defense, the U.S. Army Strategic Defense Command tasked the U.S. Army Field Artillery School (USAFAS) to find solutions. In its Artillery Attack Operations Study, approved by the Commandant of USAFAS, Major General Fred F. Marty, in February 1993, the School determined

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[109]1995 USAFACFS ACH, pp. 129-30; Fact Sheet, subj: Army TACMS Block I, 11 Apr 97, Doc III-114. See 1996 USAFACFS ACH, pp. 124-26, for background on ATACMS.

[110]Fact Sheet, subj: Army TACMS Block I, 11 Apr 97.

that an extended range would improve ATACMS's operationally capabilities by allowing it to engage more targets at a deeper range.[111]

[111]1995 USAFACFS ACH, p. 130.

This conclusion dovetailed nicely with other Army officers' observations. Based upon their experience in Operation Desert Storm in 1991, commanders, their staffs, and users also visualized the need for greater range for ATACMS. Some insisted that the existing range was inadequate and restricted the number of targets that could be engaged. With engineering changes the system could achieve twice or more the range of the current ATACMS Block I to give commanders more flexibility to attack deep targets, such as long-range, surface-to-surface missile launchers, to compensate for availability shortfalls of tactical air because of priorities, weather, and darkness, and to attack targets more quickly than tactical air could.[112]

Over the next several years, the Field Artillery School worked to introduce the Extended-Range ATACMS, renamed Improved ATACMS and finally ATACMS Block IA in 1994. During 1993, the School developed the requirements and documentation for the Army System Acquisition Review Council (ASARC) of February 1994 that would decide if the system could go into developmental engineering. Co-chaired by the Army Vice Chief of Staff and Military Deputy to the Assistant Secretary of the Army for Research, Development, and Acquisition, the Army System Acquisition Review Council reviewed the plans to extend ATACMS's range and to incorporate Global Positioning System (GPS) navigational system. The council approved the plans in February 1994 and directed the program to proceed with engineering and development of the enhancements. When fielded, the ATACMS Block IA would have a range of seventy to three hundred kilometers and would carry approximately 300 bomblets to neutralize soft targets rather than the 950 carried in the ATACMS Block I. Increased accuracy of the ATACMS Block IA, produced by the GPS navigational system, would offset the reduced number of bomblets.[113]

In 1996 the Army conducted test firings of ATACMS Block IA at White Sands Missile Range, New Mexico. Test firings from III Corps Artillery crews demonstrated the system's ability to accept digital fire missions from a Joint Surveillance and Target Attack Radar System (JSTARS) and Ground Station Module (GSM). Although all of the testing was not completed, initial successful firings prompted the Program Executive Officer, Tactical Missiles on 21 May 1996 to approve a low-rate, initial production to begin in September 1996. However, reliability concerns brought up early in 1997 caused the Gilbert F. Decker, the Army Acquisition Executive, to retain the system in low-rate initial production in 1997 to permit the Army to address effectiveness and reliability issues. A full-rate production decision was anticipated early

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[112]Ibid., pp. 130-31.

[113]Ibid., p. 130; Fact Sheet, subj: ATACMS Block IA, 11 Apr 97.

in 1998.[114]

[114]Ibid.; "ATACMS IA Fires Deep and Deadly," Field Artillery, Mar-Apr 97, p. 37, Doc III-115; Memorandum for Program Executive Officer, Tactical Missiles, subj: Acquisition Decision Memorandum for the Army Tactical Missile System Block IA Program, 22 Apr 97, Doc III-116.

In the meantime, difficulties with another missile led to significant modifications in the ATACMS program. In 1984 the Army started development on a brilliant antiarmor submunition (BAT) as part of a larger combat development program, the Tri-Service Standoff Attack Missile (TSSAM). TSSAM was a joint program to develop a stand-off cruise missile that would employ low-observable (stealth) technology to enhance survivability with the Army version being launched from the Multiple-Launch Rocket System launcher. Meanwhile, BAT was designed to employ acoustic and infrared seekers to acquire, classify, and destroy moving armored combat vehicles deep within enemy territory (one hundred kilometers or more). BAT also had allocation logic to minimize the possibility of multiple BATs engaging a single vehicle and had a large acquisition footprint to locate targets within four kilometers of the dispense point. Equally important, the Army designated TSSAM as the primary system to deliver BAT with ATACMS Block II being the secondary choice if TSSAM development should slip any more or be cut because of budget reductions.[115]

Although ATACMS could carry BAT, the Army preferred TSSAM. The latter depended upon stealth technology to evade detection and had the ability of delivering more BAT submunitions than ATACMS Block II could (twenty-two versus thirteen). Because ATACMS Block II would fly almost three times faster than TSSAM, it gave the target less time to move after the missile had been fired and to evade being hit. Although the cost-per-kill with both, TSSAM and ATACMS Block II, was almost equal, integrating BAT with ATACMS Block II would be difficult. To dispense more BAT submunitions, ATACMS Block II would require a much blunter nose, which would make it less aerodynamic. Also, experts had to solve the problem of dispensing submunitions from ATACMS Block II over the target because the missile would be traveling at supersonic speeds when it released its submunitions. Regardless of the carrier missile, BAT would enable the Army to atritt enemy armored combat vehicles at great depth and "meter the flow" to make the close battle more manageable.[116]

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[115]1995 USAFACFS ACH, pp. 108-09.

[116]Ibid., p. 109.

In November 1993 the option of using TSSAM as a BAT carrier lost its attractiveness, forcing changes in priorities. Because of test failures and the increasing cost of the missile, the Army obtained permission from the Office of the Secretary of Defense to pull out of the TSSAM developmental effort. This left ATACMS Block II as the carrier missile and meant, at least for the time being, that the Army had to find a way to dispense BAT from a fast-moving missile. Interestingly, the decision to pull out of the TSSAM program had a negative impact. By coming so late in 1993, the decision prevented the Army from funding ATACMS Block II as a carrier for BAT in Fiscal Year (FY) 1994. As a result, fielding BAT was set back three years from 1998 to 2001.[117]

In the meantime, at the request of Congress in 1992, the General Accounting Office gathered information on the BAT program. Specifically, it examined the reasonableness of BAT cost estimates, the Cost and Operational Effectiveness Analysis's support for BAT development, and the Army's plans to demonstrate operational effectiveness prior to low-rate initial production approval. Besides pointing out that costs were escalating, the General Accounting Office indicated in a draft report of late 1993 that there was no way to conduct a full BAT operational test because of safety and other constraints. Because the Army received the draft report in January 1994, nothing had been done in 1993 to address the above concerns.[118]

In 1994 a controversy between the Directorate of Operational Tests and Evaluation, a Department of Defense agency, and the Army arose over the operational tests of BAT. Picking up where the General Accounting Office left off, the Directorate of Operational Tests and Evaluation wanted the Army to fire two fully operational ATACMS Block II missiles with BAT warheads (twenty-six submunitions) to determine if they worked properly. In contrast, the Army wanted to fire only the number of warheads required to prove that BAT worked because it did not have sufficient numbers of threat vehicles

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[117] Ibid., p. 109-10.

[118] Ibid., pp. 110-11; Memorandum for Record, subj: DCD Input to Annual Command History--Comments on Coordinated History, 21 Apr 98, Doc III-116A.

to justify using two BAT warheads.[119]

[119]Ibid., p. 111.

Held in 1994, design verification tests significantly reduced the concerns with BAT. In the initial test the Army dropped two BATs from an airborne aircraft to validate hardware design. Both hit their respective targets. Minor problems, however, in a subsequent test in 1995 caused BAT to fail and miss the target. This influenced the Army to delay testing while additional engineering changes were made. BAT drop testing from aircraft resumed in 1996 and produced several successful engagements. On 16 October 1997 a flight test occurred in which BAT submunitions were successfully dispensed from the carrier for the first time.[120]

Although the original justification -- the Soviet and Warsaw Pact threat -- had disappeared with the end of the Cold War, the requirement for BAT still existed. In 1994 the Army explained, "The greatest potential threat to US Forces is that posed by armored and motorized forces. These highly mobile armored maneuver forces, supported by armed helicopters, are expected to pursue battlefield objectives using numerical force superiority, speed, and penetration."[121] The Army also noted that it had an inadequate capability to attack armored vehicles and surface-to-surface missile launchers beyond the range of close combat weapons. In addition, the Army had the urgent need for an autonomous, terminal homing submunition to defeat moving and stationary targets in the second echelon of the threat array.[122]

In view of the requirement to attack stationary armored vehicles and surface-to-surface missile (SSM) transporters, erectors, and launchers (TELS), the Army visualized the need for improving the BAT. The BAT Pre-Planned Product Improvement (P3I) would have the capabilities of attacking moving armor, stationary armor, hot or cold armor, SSM TELS, and heavy multiple rocket launchers and would be more resistant to weather and countermeasures. Carrying six BAT submunitions rather than thirteen as the ATACMS II would, ATACMS Block IIA would have a range of one hundred to three hundred kilometers and would use a global positioning system (GPS) augmented guidance system that was similar to the one in the ATACMS IA and ATACMS II to improve accuracy. As planned in 1997, the BAT P3I would be fielded in ATACMS Block II in FY 2004. ATACMS Block IIA with BAT P3I would also have an initial operational capability of FY 2003.[123]

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[120]Ibid., pp. 111-12; Interview, Dastrup with MAJ Jay Hilliard, TSM RAMS, DCD, 13 Feb 98, Doc III-117.

[121]1995 USAFACFS ACH, p. 112.

[122]Ibid.

[123]Ibid., pp. 112-13; Fact Sheet, subj: Army TACMS Block II, 11 Apr 97, Doc III-118; Fact Sheet, subj: Army TACMS Block IIA, 11 Apr 97, Doc III-119; Fact Sheet, subj: BAT Submunition, 11 Apr 97, Doc III-120; Interview, Dastrup

HIGH MOBILITY ARTILLERY ROCKET SYSTEM

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with MAJ Jay Hilliard, TSM RAMS, DCD, 13 Feb 97.

Although the Army first envisioned the need for a light multiple rocket launcher system in the 1980s as it started to field more light divisions, efforts to introduce it increased in urgency in the 1990s. In a message in mid-September 1990, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC) wrote, "TRADOC support for the HIMARS [High Mobility Artillery Rocket System] program has not waned. Indeed recent world events [the crisis in the Persian Gulf] serve to highlight the need for such a capability. The HIMARS program will continue to receive full TRADOC support. . . ."[124]

Although HIMARS was well-received throughout the Army with a few exceptions and showed promise, budgetary problems stalled development. In 1991 the Army did not fund HIMARS in its Long-Range Research, Development, and Acquisition Plan because the payoff of fielding two battalions was not deemed worth the cost of a new start. The Operational Requirements Document (ORD) stated only a requirement for two battalions with three being desired, whereas Legal Mix VII, being conducted by the U.S. Army Field Artillery School, supported a requirement of four to six battalions based on the Army's need to respond to two major regional contingencies in rapid sequence.[125] Notwithstanding the requirement for increased "capability and lethality of. . . early deploying forces," HIMARS lost funding in the Army's program objective memorandum in March 1992 because the small amount of funding marked the program as being inexecutable by budget managers in

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[124]1995 USAFACFS ACH, pp. 132-33. See 1994 USAFACFS, pp. 163-86 for an in-depth discussion of the development of HIMARS.

[125]1995 USAFACFS ACH, p. 133.

Headquarters, Department of the Army.[126]

[126]Ibid., pp. 133-34.

As a part of the effort to obtain HIMARS, in the meantime, the Field Artillery School began working as early as the spring of 1992 to find funding to construct one or two prototypes. Prototypes would permit commanders and other Army officials to observe firsthand the system's capabilities and erase any doubts about the necessity of funding it. Perceiving that the Department of Defense's Science and Technology Initiative (Thrust) Number Five, Advanced Land Combat, could be an avenue to begin HIMARS development and gain momentum with the program, the School looked to that source.[127] However, Dr. Fenner Milton, the chairperson of Thrust Number Five, in December 1992 only authorized money ($4.2 million) for Fiscal Years (FY) 1994-1996 to develop technology that could feed into HIMARS because of its potential to provide a substantial warfighting capability to early deploying light forces. Notwithstanding this, the HIMARS program still lacked funding for prototype development because Dr. Milton only provided money for developing the technology that might be used in HIMARS and not for developing prototypes.[128]

The Field Artillery School's struggle to field HIMARS continued. On 24 February 1993 the Office of the Assistant Secretary of the Army for Research and Development wrote that Dr. Milton had expressed interest in working with the Field Artillery School. He wanted to reach an overall research and development strategy that supported HIMARS, that was affordable, and that could be justified.[129] In a subsequent telephone conversation with the Director of the Directorate of Combat Developments (DCD), Field Artillery School, on 5 March 1993, Dr. Milton reemphasized his support for HIMARS. With this, funding from Thrust 5 seemed possible for HIMARS prototypes, but it never came.[130]

Meanwhile, the School pursued action with the U.S. Army Tank and Automotive Command, the U.S. Army Missile Command, the Program Manager of MLRS, and others to build a mockup HIMARS. This would permit collecting user input, maintaining visibility at high-profile events, and demonstrating the feasibility of the design. Equally important, the mockup could eventually lead to funding for prototypes.[131] Although funding for HIMARS remained critical during 1993, the mockup, which could be carried by a C-130 but could not fire, could elevate and traverse to fixed positions, had a two-person

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[127]Ibid., p. 134.

[128]Ibid.

[129]Ibid., pp. 134-35.

[130]Ibid., p. 135.

[131]Ibid.

crew, and produced the desired results. At the Association of the United States Army convention in October 1993, the Chief of Staff of the Army, General Gordon R. Sullivan, expressed an interest in the mockup. Based upon successful mockup demonstrations, the Undersecretary of Defense and other Department of Defense agencies also expressed an interest in developing HIMARS prototypes. Even though high-level support existed, even though the Depth and Simultaneous and Attack Battle Lab at the Field Artillery School and the Joint Precision Strike Demonstration Task Force were working to obtain funds, and even though a test firing in December 1993 was successful, HIMARS still remained unfunded at the close of 1993.[132]

[132]Ibid., pp. 135-36.

Although funding did not materialize in 1994, support for HIMARS continued. In January 1994 the Field Artillery School shipped the HIMARS mockup to Fort Polk, Louisiana, for the light commander conference. Army commanders there "loved" HIMARS as did the Marines, who desired to display it at Twenty Nine Palms, California. As many in the Field Artillery School anticipated, the Marine Corps enthusiastically endorsed HIMARS. In fact, School participants at the March 1994 demonstration for the Marine Corps reported, "They [Marine Corps] were all impressed with the HIMARS."[133] Eight months later, the Army Chief of Staff expressed his support.[134]

Although the support failed to produce any funding at the end of 1994, Program Manager, Multiple-Launch Rocket System (MLRS) and the Rapid Force Projection Initiative (RFPI), a joint effort sponsored by MICOM and Dismounted Battle Space Battle Laboratory, Fort Benning, Georgia, signed a memorandum of agreement early in 1995 to build four HIMARS prototypes with RFPI putting $33 million towards development. The RFPI, a multi-year effort, planned to conduct an Advanced Concepts Technology Demonstration (ACTD) in 1998 using new target acquisition systems, "shooters," and command and control systems. One of the new systems would be prototype HIMARS. After showing potential users the new system's capabilities, the RFPI planned to leave selected pieces of equipment behind for use in the field for as long as two years. For example, three of the four HIMARS prototypes would be left behind for the XVIII Airborne Corps for an extended user evaluation that would last for approximately two years beginning in October 1998.[135]

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[133]Ibid., p. 136.

[134]Ibid., pp. 136-37.

[135]Ibid., p. 137.

In 1996 the HIMARS experienced mixed progress. Even though the Field Artillery School reaffirmed the requirement for HIMARS, in July 1996 the Army removed funding for the first two years of engineering and manufacturing development (EMD) from the FY 1998 Program Objective Memorandum. As TSM RAM explained, this produced a disconnect. Funded when the Army and the contractor signed a contract in February 1996, the four RPFI ACTD prototypes would be fielded late in 1998. User testing by the XXVIII Airborne Corps would be completed about 2000. Without funding for engineering and manufacturing development of HIMARS, the Army slipped the start of development of the objective system to Fiscal Year 2004 and set the first unit equipped date in 2009. The lack of EMD funding, therefore, created a gap of several years between the end of user testing with the prototypes and the first unit equipped date. As a result, the Field Artillery School feared the inability of incorporating lessons learned from the prototype testing into the development of the objective HIMARS system. Funding had to be restored to eliminate the gap and minimize losing the lessons learned and contractors with development experience.[136]

In 1997 the Army partially resolved the funding issue. With the availability of some funds, the Army decided to initiate a maturation phase in 2001, modifications of HIMARS based upon the extended user evaluation, engineering and manufacturing development in 2000, procurement in 2004, and fielding in 2005. Because the system would add considerable fire support capability to early deploying light forces and because Emerging Force Structure studies called for each of the two field artillery brigades in support of the light division to consist of two HIMARS battalions and one towed artillery battalion, the Army funded HIMARS in the POM.[137]

FIREFINDER RADARS

Because of the growing threat of counterfire from hostile fire support systems, the Army initiated action in 1984 to improve its AN/TPQ-36 and AN/TPQ-37 radars. The Army considered these radars to be too large and heavy for AirLand Battle and use with the light forces that were being developed. Through product improvements the Army planned to field a mobile, survivable Firefinder radar to replace the Q-36 and Q-37 radars in the target acquisition battery. To do this the Army created a block improvement program in 1985-86 to integrate existing Firefinder radars into a single follow-on system that would be based on the Q-36. Ongoing

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[136]1996 USAFACFS ACH, pp. 139-40; Memorandum for Record, subj: 1997 Annual Report for TSM RAMS, 13 Feb 98, Doc III-121.

[137]Interview, Dastrup with CPT Jason W. Robbins, TSM RAMS, DCD, 13 Feb 98, Doc III-122; Memorandum for Record, subj: 1997 Annual Report for TSM RAMS, 13 Feb 98.

improvements to the Q-36 became Block I. Block II outlined incorporating crew reduction and self-leveling of the Q-36 radar and placing it on a five-ton truck, while Block III would add electronic improvements to the Q-36 radar late in the 1990s. Fielded on either a five-ton truck or track vehicle for the heavy division or a High Mobility Multipurpose Wheeled Vehicle (HMMWV) for the light forces, the Q-36 Block III radar would provide highly mobile and light target acquisition support. Because of the radar's configuration, the crew could rapidly occupy positions, detect targets up to thirty-six kilometers in range, and then quickly displace for better survivability.[138]

[138]1996 USAFACFS Annual Historical Review, p. 90.

In 1987 the U.S. Army Field Artillery School split the Q-36 Block II program into Block IIA and Block IIB. With Block IIA the School outlined reducing the size of the Q-36 to fit on a five-ton truck to permit the crew to emplace the radar in fourteen minutes and displace it in five minutes and provide target acquisition for heavy divisions. In comparison, Q-36 Block IIB improvements focused on placing the radar on a trailer and towing it with a HMMWV to support the light forces. Block IIB would also reduce the number of vehicles required to transport the system and enhance strategic deployability.[139]

In view of the Army's shift from forward-deployed forces in Europe to power projection from the United States after the Cold War ended, the Commandant of the Field Artillery School, Major General Raphael J. Hallada (1987-1991), eliminated the Q-36 Block IIA early in the 1990s and placed priority and all funds into Block IIB. The Army then divided Block IIB into two phases or versions that would improve the survivability, mobility, and capability of the Q-36. In phase one (Q-36 version 7/HMMWV) the operations control group would be mounted on an M1097 HMMWV that would tow the M116A2 cargo trailer. The second M1097 HMMWV would carry an MEP 112A generator and tow the Antenna Transceiver Group that would be mounted on a modified M116A2 trailer. The M998 HMMWV reconnaissance vehicle would pull a second M116A2 trailer that would have an additional MEP112A generator. This would improve the radar's transportability and mobility and produce a radar that could support both light and heavy forces.[140]

Subsequent to these improvements, the Army planned to upgrade the Q-36 through electronics enhancements in phase two (Q-36 version 8). Besides being the first major pre-planned product improvement to the radar to prevent system obsolescence and decrease maintenance requirements, the electronics upgrade would eliminate the S-250 shelter and provide a flat panel display/control unit mounted in a Lightweight Multi-Purpose Shelter. The upgrade would also incorporate a new high-speed signal processor to furnish faster access to data (fifty to one hundred targets per minute), would increase memory and digital map storage, and would reduce maintenance and shelter space requirements. Additionally, the upgrade would increase detection ranges for

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[139]1995 USAFACFS ACH, pp. 138-39.

[140]Ibid., p. 139.

mortars and field artillery from twelve kilometers to eighteen kilometers, allow remote operations up to one hundred meters from the shelter, provide weapon type identification, reduce the incidence of false targets, and enhance the probability of location.[141]

[141]Ibid., pp. 139-40.

Work on the Q-36 version seven and Q-36 version eight produced viable results by 1994. Each active division artillery would receive three radars, while each active separate maneuver brigade would get one. Initial fieldings of the Q-36 version seven radar began late in 1993 and were completed in July 1994. Because of delays in contract awards for long-lead items, however, the Army fielded the radars without the Modular Azimuth Positioning System (MAPS). This required retrofitting these Q-36s with MAPS between August 1994 and July 1995. This action completed the fielding of the Q-36 version seven. Meanwhile, low-rate initial production for Q-36 version eight radars started in December 1993 with a successful initial operational test and evaluation (IOTE) of February 1996. In response, the Army awarded a production contract for the electronic upgrade to Northrup-Grumman on 19 August 1996 for eleven Q-36 version eight systems for delivery in 1998 for testing.[142]

In the meantime, the Field Artillery School introduced another change to its counterfire radar system modernization program in 1990. Because the existing Firefinder Q-37 radar lacked the range, survivability, mobility, and target processing and identification capability to support future requirements and because the Q-36 modernization effort would not meet all of the Field Artillery's radar requirements as initially planned, the School identified the need for the Advanced Target Acquisition Counterfire System (ATACS) to replace the Q-37. The Q-37, which was 1970s radar technology, was obsolete and vulnerable to enemy radar, radio intercept, and locating and jamming systems. The Advanced Target Acquisition Counterfire System would take advantage of leap-ahead technology to give the Army a passive system or, at a minimum, passive or active cuing, would reduce the equipment and manpower needs significantly, and would furnish support to the corps area of influence in AirLand Operations. In

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[142]1996 USAFACFS ACH, pp. 143-44; Interview, Dastrup with Ron Anderson, Material Requirements and Integration, DCD, 27 Feb 98, Doc III-123.

addition, it would be capable of driving on and off a C-130 and larger aircraft and air insertion by CH-47D and would reduce crew size from twelve to six.[143]

[143]1995 USAFACFS ACH, pp. 141-42.

In 1991 three alternatives existed to satisfy the Advanced Target Acquisition Counterfire System requirement. First, the Army could start a new research and development program. Second, it could introduce material changes to the existing Q-37 that would be less expensive than a new start. Third, the Army could negotiate a memorandum of understanding with France, the Federal Republic of Germany, and the United Kingdom to enter the European Counterbattery Radar (Cobra) program. Of the three possibilities, the last was the least expensive and most promising. In view of this, the Army opened negotiations with the Europeans in August 1991 to participate in their program, but it lacked funding to proceed beyond this point with Cobra. Later in 1992, the Army withdrew entirely because Cobra was becoming too expensive and large and did not meet the Field Artillery's requirements.[144]

In 1993-94 the Army chose to upgrade the existing Q-37 to meet its requirements for target acquisition because it was less expensive than a new start. As of 1994, the Enhanced Firefinder AN/TPQ-37 (Block I) program and the Firefinder AN/TPQ-37 Pre-planned Product Improvement (Block II) program existed. Basically, the Q-37 Block I represented an upgrade to the existing Q-37. Enhancements would include improved transportability, better mobility, and the incorporation of MAPS. The reliability, availability, and maintainability of the system would be improved through hardware and software upgrades. After successful testing was completed at the Yuma Proving Ground, Arizona, production of twenty-six modification kits began in 1995. During the following year, the Army began fielding the Q-37 Block I radar to the active force. Funding, however, limited fielding to twenty-six systems through 1997. This meant that only part of the active force would have the Q-37 Block I radar. The rest were left with the original Q-37

[144]Ibid., p. 142.

until more funding could be obtained.[145]

[145]Ibid., pp. 142-43; Interview, Dastrup with Ron Anderson, Materiel Requirements and Integration Division, DCD, 28 Feb 98; Memorandum for Ron Anderson, Material Requirements and Integration Division, DCD, subj: 1997 USAFACFS Annual Command History, 2 Mar 98, Doc III-124.

The Advanced Target Acquisition Counterfire Radar, renamed Advanced Firefinder System in 1992, the AN/TPQ-37 Firefinder Pre-planned Product Improvement P3I Block II in 1994, and AN/TPQ-37 Block II in 1996, offered significant improvements over the existing Q-37. Utilizing advanced technology, the Q-37 Block II would provide rapid and increased target location, improved accuracy, and improved target classification at greater ranges. At the same time it would significantly reduce equipment and manpower requirements and would improve transportability, maintainability, and reliability for increased effectiveness on the battlefield. Besides this, it would furnish support to the entire corps area of influence with enhanced target processing and multiple friendly fire capability. Although research and development funding would not be available until Fiscal Year 1997, the U.S. Army Training and Doctrine Command (TRADOC) approved the operational requirements document, written by the Field Artillery School, in August 1995. Subsequently, the Department of the Army approved the requirements document in September 1996, and the request for proposal went out to industry in the fall of 1997.[146]

THE BRADLEY FIRE SUPPORT VEHICLE AND STRIKER

In 1997 the U.S. Army Field Artillery School (USAFAS) continued working on fielding the Bradley Fire Support Vehicle (BFIST), which was scheduled to be the successor to the M981 Fire Support Vehicle (FISTV). Late in the 1970s, the U.S. Army Training and Doctrine Command (TRADOC) working group, Close Support Study Group (CSSG) II, met to optimize observed fire support for the maneuver forces. Besides reaffirming the necessity of the Fire Support Team (FIST) that had been created in the mid-1970s to integrate fire support with the maneuver arms at the company level, the group recommended fielding a mobile fire support vehicle to provide reliable, secure communications.[147]

In its drive to ensure effective fire support, CSSG II also considered alternatives to the improved M113 armored personnel carrier that had been designated as the FIST vehicle in the mid-1970s. The first option involved employing the XM2 infantry fighting vehicle/the XM3 cavalry fighting vehicle family of vehicles. Either vehicle offered greater mobility and survivability than the M113 and even the newer M981. The cavalry fighting vehicle was a derivation of the infantry fighting vehicle with minor interior modifications for crew size, additional ammunition, and equipment storage and did not have the fire port and associated weapons. Second, the Field

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[146]1996 USAFACFS ACH, pp. 146-47; Interview, Dastrup with Ron Anderson, 27 Feb 98; Memorandum for Ron Anderson, subj: 1997 USAFACFS Annual Command History, 2 Mar 98.

[147]1995 USAFACFS ACH, p. 144.

Artillery could readily adopt the M981. After examining the options, the study group recommended fielding the M981 as the Field Artillery's fire support vehicle, retaining the M113, and using both vehicles as interim solutions until the XM2/XM3 (Bradley Fighting Vehicle) modified for fire support missions and called the BFIST could be introduced as the long-term solution.[148]

[148]Ibid., pp. 144-45.

CSSG II did not heartily endorse the M113 or M981 as the fire support vehicle for several reasons. Early in the 1980s, the Army would be fielding the XM1 (Abrams) tank and the XM2/XM3, which would provide significant mobility and survivability over the M113 and M981. According to doctrine, the fire support vehicle required mobility and survivability equal to the supported force. Only XM2/XM3 vehicles altered as a BFIST could furnish the requisite mobility and survivability. In the meantime, the Field Artillery would have to employ M113s and M981s until sufficient numbers of XM2s/XM3s were available for fire support.[149]

Operation Desert Storm (ODS) of 1991, however, highlighted the deficiencies of the M981. During the war, mobility and sustainability problems hampered the FIST's ability to keep pace with the maneuver forces that were equipped with the Abrams tank and the Bradley fighting vehicle. Also, the M981 lacked self-protection against armored threats and presented a unique signature that made it easy to identify as a fire support vehicle, causing it to be an attractive and vulnerable target for hostile fire. In addition, infantry and armor units did not stock sufficient spare parts for the M981 because it was a low-density vehicle.[150]

After funding became available early in the 1990s and after the maneuver arms got their Bradley fighting vehicles, equipping the Field Artillery with the BFIST became a reality and promised to solve the problems created by the M981. Outlined in the Operational Requirements Document approved by the U.S. Army Training and Doctrine Command in September 1994,

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[149]Ibid., pp. 145-46.

[150]Ibid., p. 146; 1996 USAFACFS ACH, p. 149; Briefing, subj: BFIST, 1997, Doc III-125.

the BFIST would have mobility comparable to the supported force, use common repair parts, and present a common signature with the supported force. Besides having a 25-mm. chain gun, the BFIST would also have a second-generation forward looking infrared (FLIR) and digitization.[151]

[151]1995 USAFACFS ACH, pp. 146-47; "BFIST Is On The Way," Field Artillery, May-Jun 97, p. 45, Doc III-126.

In 1995-96 combat and materiel developers envisioned two models of BFIST: the M7 and M7A1. The first version involved retrofitting a FIST mission package onto a Bradley A2 ODS chassis. The FIST mission package included laser designator, ring laser gyroscope, forward entry device, lightweight computer unit, and associated components to process digital information. The BFIST A2 ODS also would have an eye-safe laser rangefinder, a global positioning system, a driver's thermal viewer, and a battlefield combat identification system (when it became available) to reduce the probability of fratricide. With a scheduled fielding of 2004, the BFIST M7A1 would be more advanced, incorporate a Bradley A3 chassis with the FIST mission package, add a core electronic architecture to process messages on the digitized battlefield, and have two second-generation FLIR sights, one for the gunner and an independent sight for the commander. The second-generation FLIR would double the combat identification range of the first-generation FLIR to reduce the probability of fratricide, while full digitization would enable combat forces to move, set, attack, move/regenerate, and attack in a continuous cycle.[152]

Although critical milestone decisions were not made in 1996, work on the BFIST moved forward. On 1 October 1996 the contractor, United Defense Partnership, delivered four prototype BFISTs to the Army for testing. During January-October 1997, technical testing conducted at the Aberdeen Proving Ground, Maryland, focused on system reliability and maintainability, fire support team mission equipment performance, and system integration. Overall, the testing demonstrated that all critical system design characteristics had been met.[153]

In the meantime, the Army made several critical decisions about the BFIST. In May-June 1997 the Army conducted limited user testing. Using soldiers from the 3rd Infantry Division and placing the BFIST in an operational environment at Fort Sill in which it functioned as a fire support vehicle for the first time, the Army encountered software problems that restricted the vehicle's ability to perform its mission as desired. Because the vehicle's overall performance met the requirements during the test and because the system satisfied design characteristics during technical testing, the Army moved the BFIST into limited rate initial production with the objective of having an initial test and development evaluation completed in 1999 on forty-nine vehicles.[154]

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[152]1996 USAFACFS ACH, p. 150.

[153]Ibid., p. 151; LTC Robert M. Hill, "Future Watch: Target Acquisition and Precision Attack Systems," Field Artillery, Jan-Feb 96, p. 18, Doc III-127; Msg, subj: Answers to Questions, 18 Feb 98, Doc III-128.

[154]Interview, Dastrup with MAJ Neil J. Hamill, Material

Requirements and Integration Division, DCD, 17 Feb 98, Doc III-129; "BFIST is On the Way," Field Artillery, May-Jun 97, p. 45; Msg, subj: Answers to Questions, 18 Feb 98.

Meanwhile, the Combat Observation Lasing Team (COLT) employed the M981 fire support vehicle. Besides lacking mobility and stealth, the M981 had been designed for armored and mechanized forces and presented a unique signature in the light forces that used HMMWVs as their scout vehicles. In response to this, TRADOC approved a new BFIST Operational Requirements Document in April 1997 written by the Field Artillery School to leverage fire support vehicle technology for heavy and light forces. In the Operational Requirements Document the Field Artillery School retained the BFIST for the heavy forces and urged developing a vehicle with BFIST mission capabilities for the light forces by integrating BFIST mission equipment package into a High Mobility Multipurpose Wheeled Vehicle chassis to provide heavy and light force Combat Observation Lasing Teams with unprecedented mobility, flexibility, and stealth and replace the M981. Also, for the light forces the HMMWV COLT would be less noticeable because it would be like the other scout vehicles and present a common signature, would save Bradley assets for fire support teams, and would lower operating costs for COLTs. Based upon its performance in the Task Force XXI Advanced Warfighting Experiment of March 1997, the Striker vehicle as well as the Striker concept that furnished six Striker vehicles to each field artillery brigade to operate in pairs for continuous operations and security was adopted by the U.S. Army as a Warfighting Rapid Acquisition Program (WRAP) by the Chief of Staff of the Army on 14 May 1997. This meant development and fielding would be accelerated.[155]

EYES FOR LIGHT FIGHTERS:
THE LIGHTWEIGHT LASER DESIGNATOR RANGEFINDER
AND GUNLAYING AND POSITIONING SYSTEM

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[155]Interview, Dastrup with Hamill, 17 Feb 98; Fact Sheet, subj: Striker-HMMWV COLT, undated, Doc III-130; Briefing, subj: BFIST, 1997; Briefing, subj: Striker Overview, 30 Jan 98, Doc III-131; "Striker/Reconnaissance Team," Field Artillery, Jan-Feb 96, p. 38, Doc III-132.

Early in the 1990s, light fire supporters employed the Ground/Vehicular Laser Locator Designator (G/VLLD) to lase targets for precision-guided munitions. The system weighed 107 pounds, along with other essential equipment reduced the mobility of the light fire support team, and did not meet its needs. In response to this situation and the lack of a man portable system to designate targets, the Field Artillery School wrote an Operational Requirements Document that was approved in February 1994 by the U.S. Army Training and Doctrine Command to replace the G/VLLD with the Lightweight Laser Designator Rangefinder (LLDR). Although the LLDR remained unfunded for several years, the School still pursued it. Combining the latest technical advances in position/navigation (Precision Lightweight Global Positioning System), thermal sights, and laser development, the LLDR was a lightweight, compact, man-portable system designed for dismounted or mounted operations. Besides determining range, azimuth, and vertical angle, the LLDR would permit light forces to perform fire support functions quickly and accurately on a fast-paced, less dense, and more lethal battlefield and offered the best alternative to the G/VLLD. Because of its modular design, it could be readily tailored to the mission. In its target location configuration the LLDR weighed about twenty pounds and had the ability of locating targets accurately out to ten kilometers and seeing the battlefield with a near, all-weather capability. An integrated thermal night-sight provided continuous day/night operations and the ability to see through obscurants, such as fog and smoke. If needed, the LLDR could be configured with a separate laser designator module to paint moving and stationary targets to be engaged by precision munitions. This configuration caused the system to weigh thirty-five pounds. Equally important, the LLDR could be used in training environments because it had an eye-safe rangefinder but not an eye-safe designator.[156]

In 1996-97 the situation with the LLDR changed dramatically. Recognizing the need for such a piece of equipment, Program Manager for Nightvision in 1996 funded the

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[156]MG Randall L. Rigby, "The Lightfighter FO," Field Artillery, May-Jun 97, p. 1, Doc III-133; "Eyes of the Light Forces: Equipping Observation Teams," Field Artillery, May-Jun 97, pp. 27-28, Doc III-134; Interview, Dastrup with MAJ Ron Todd, Material Requirements and Integration Division, DCD, 17 Feb 98, Doc III-135; LTC Robert M. Hill, "Future Watch: Target Acquisition and Precision Attack Systems," Field Artillery, Jan-Feb 96, p. 19, Doc III-136; Briefing, subj: LLDR, undated, Doc III-137; Memorandum for Cdr, TRADOC, subj: Urgency of Need Statement for LLDR Program, 23 Jan 97, Doc III-138; Memorandum for See Distribution, subj: Approved Operational Requirements Document for the LLDR, 10 Mar 94, Doc III-139.

LLDR through the end of engineering and manufacturing development. Subsequently, the Field Artillery School made the system an initiative of the Task Force XXI Advanced Warfighting Experiment of March 1997. During the experiment, the LLDR performed well and was subsequently approved as a Warfighting Rapid Acquisition Program (WRAP) in April 1997. This designation would accelerate fielding to the light forces and integration onto a High Mobility Multipurpose Wheeled Vehicle.[157]

[157]Interview, Dastrup with Todd, 17 Feb 98; Fact Sheet, subj: LLDR, undated, Doc III-140; Memorandum for MAJ Ron Todd, Material Requirements and Integration Division, DCD, 26 Feb 98, Doc III-141.

As work was progressing with LLDR, the Field Artillery School took steps to acquire the Gun Laying and Positioning System (GLPS). For years the field artillery battalion provided survey. This meant that towed howitzer batteries and M109A5 155-mm. self-propelled howitzer batteries had to wait for conventional survey to be furnished by the battalion, which was time consuming and inefficient, in order to furnish accurate fires. In light of this, the Field Artillery School wrote an Operation Requirements Document that was approved by TRADOC in July 1993 for the GLPS. The system was a tripod-mounted positioning and orienting device that consisted of a gyroscope, an electronic theodolite, an eye-safe laser rangefinder, and a Precision Lightweight Global Position System Receiver and that would give the battery autonomous positioning and directional capability. Lightweight and mobile, the GLPS established an orienting station, allowed the battery commander to position and orient his howitzers accurately and rapidly, and permitted retaining the unreliable and old Positioning and Azimuth Determining System in reserve as a backup. Based upon its performance in Task Force XXI Advanced Warfighting Experiment of March 1997, GLPS was approved to be part of the Army's Warfighting Rapid Acquisition Program (WRAP), which would expedite fielding.[158]

ADVANCED FIELD ARTILLERY TACTICAL DATA SYSTEM

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[158]Hill, "Future Watch: Target Acquisition and Precision Attack Systems," p. 20; MG Leo J. Baxter, "Honing the Edge: State of the Field Artillery 1997," Field Artillery, Nov-Dec 97, p. 2, Doc III-142; Interview, Dastrup with SFC Barry, Material Requirements and Integration Division, DCD, 17 Feb 98, Doc III-143; Fact Sheet, subj: GLPS, undated, Doc III-144; Memorandum for General Ross, subj: Delegation of Milestone Decision Authority for GLPS, 16 Mar 93, Doc III-145; Memorandum for See Distribution, subj: Approved Operational Requirements Document for GLPS, 12 Jul 93, Doc III-146.

Almost ten years after the Field Artillery had initially recognized the need for a computer for command, control, and communications to improve its responsiveness on a mobile battlefield, it gained its first experience with the application of automated data processing in 1959 with the development of the Field Artillery Digital Automated Computer (FADAC). The computer calculated fire direction data faster and more accurately than humans could and promised highly accurate and rapid fire. However, the breakdown of equipment, the requirement to back up the computer with manual procedures, and the lack of education about the computer's capability caused many Field Artillerymen of the late 1950s and early 1960s to accept computerized gunnery reluctantly.[159]

[159]1995 USAFACFS ACH, p. 148.

The drive for better responsiveness as the battlefield was becoming more mobile and desire for first-round accuracy encouraged the Army to develop a second-generation computer for field artillery command, control, and communications. Between 1961 and 1965, the Army conducted extensive studies to determine where improvements to automation should be made. The results of the studies led to the requirement for the Tactical Fire Direction System (TACFIRE), which was fielded in the mid-1970s.[160]

Because TACFIRE was large, heavy, and based on 1950s and 1960s technology, the Army took steps to replace it. In response to a 13 November 1978 memorandum from the Office of the Undersecretary of Defense for Research and Engineering, the Army initiated work on a successor system that would optimize operational efficiency, simplify training, ease maintenance requirements, reduce life cycle costs, and improve survivability. Later in 1981, the Army and the Department of Defense (DOD) approved developing the Advanced Field Artillery Tactical Data System (AFATDS) as part of the Army Tactical Command and Control System (ATCCS), which would be a family of computers, peripherals, operating systems, utilities, and software to support each individual battlefield operating system.[161]

After a decade of work on the hardware and the software that was fraught with many software developmental delays, the Army started testing AFATDS to determine its readiness for fielding. According to the Field Artillery School in 1990, AFATDS represented a complete departure from TACFIRE. Whereas AFATDS offered distributive (decentralized) processing using office computers, networking of computers, and employing task menus, TACFIRE depended upon centralized command and control and was a format driven system. TACFIRE taxed training because the operator had to memorize many formats and legal entries and had to use them frequently to remember them. As

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[160]Ibid., pp. 148-49.

[161]1996 USAFACFS ACH, pp. 152-53.

such, AFATDS would be more user friendly and a significant improvement over TACFIRE.[162]

[162]Ibid., p. 153.

Work on the software for AFATDS pressed forward in 1990-91. On 27 April 1990 the Army signed the full-scale development contract with Magnavox for version one (AFATDS 96) software. Scheduled for fielding in 1994, version one would update the software developed for the concept evaluation program that was conducted late in 1989, provide initial functionality at all echelons of fire support from the corps to platoon level, and would integrate field artillery, mortar, naval gunfire, and close air support into planning and execution functions. In fact, the Preliminary Design Review held in November 1991 verified moving version one software (AFATDS 96) into the critical design phase of development with Force Development Testing and Experimentation (FDTE) scheduled for September 1993. However, software problems forced rescheduling the FDTE for October 1993. Work on version two (AFATDS 97) software, which would have more capabilities than version one, in the meantime, would begin during the latter months of 1992. Subsequently, a private contractor or the government would produce version three (AFATDS 00) software, which would have even more capabilities than version one or two and would meet the objective system requirements.[163]

Technical problems with version one software that arose during technical testing in 1993 caused delaying the FDTE again. In fact, in August 1993 the Army slipped the FDTE from October 1993 to January 1994. Pushing back the FDTE also forced moving the Initial Operational Test and Evaluation (IOTE) from May-June 1994 to July-September 1994. Further version one software problems caused the IOTE to be moved into mid-1995.[164]

After FDTE of May 1995 determined that AFATDS version one was ready for operational testing, the Operational Test and Evaluation Command held an IOTE in July-September 1995 at Fort Hood, Texas. The test unit, the 1st Cavalry Division, conducted a pilot test, a record test, and an interoperability test. Although some deficiencies existed, no single or aggregation of deficiencies warranted rating the system as being ineffective. During the tests, AFATDS version one demonstrated its ability to receive and process information from a variety of sources to support tactical field artillery fire plans. In view of this, the Office of the Assistant Secretary of the Army for Research, Development, and Acquisition authorized the Program Executive Officer for Command, Control, and Communications Systems in December 1995 to proceed with full-rate production with AFATDS and to field version one software.[165]

Following successful tests, the Army planned to field the

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[163]Ibid., pp. 153-54.

[164]Ibid., pp. 154-55.

[165]Ibid., p. 155.

different versions of AFATDS version two between 1997 and 1999 as AFATDS 97, AFATDS 98, and AFATDS 99 and version three in 2000 as AFATDS 00. As explained by U.S. Army Training and Doctrine Command (TRADOC) System Manager (TSM) for Fire Support Command, Control, and Communications (FSC3) in the fall of 1996, the releases would enhance corps and echelons-above-corps deep operations functions, joint capabilities, and Multiple-Launch Rocket System (MLRS) and Paladin howitzer interfaces and lead to full technical fire direction capabilities. Specifically, AFATDS 97 would furnish corps and echelons-above-corps functionality, modify MLRS/Army Tactical Missile System (ATACMS) command and control processes, and enable the Field Artillery to plan and execute deep battle operations faster and safer than ever before.[166]

[166]Ibid., pp. 155-56.

AFATDS 98, AFATDS 99, and AFATDS 00 would provide additional capabilities. To be released in 1998, AFATDS 98 would concentrate on U.S. Marine Corps/joint functionality, meet Department of Defense computing standards, and facilitate greater interoperability among the services. AFATDS 99, scheduled for release in 1999, would begin the move toward technical fire direction on a single platform by building direct interfaces with MLRS and Paladin, while AFATDS 00 would be version three software, would be the objective system, and would be released in 2002. With AFATDS 00 software, AFATDS would automate all 321 specified fire support tasks developed at the Field Artillery School.[167]

In the midst of developing, testing, and fielding of the operational software, the Field Artillery School participated in Task Force XXI Advanced Warfighting Experiment (AWE) in 1997 that focused on the digitized brigade of 2003. The AWE consisted of live and constructive simulations and culminated with a brigade task force rotation at the National Training Center, Fort Irwin, California, in March 1997 and employed experimental AFATDS software and hardware as one of its digitized systems. As might be expected, the AWE produced key lessons for AFATDS. One officer in the TRADOC System Manager (TSM) AFATDS in the Field Artillery School noted that most difficult challenge for combat developers was introducing software in the age of computers and digitization of military forces. Under the AFATDS development and fielding concepts the unit received the complete hardware package just prior to new equipment training. However, the Army did not deliver the objective AFATDS software. It delivered digitized AFATDS software incrementally in a series of versions with each

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[167]Ibid., p. 156; LTC Douglas G. Beley, "AFATDS and the Task Force AWE: Insights for Fire Support Leaders," Field Artillery, Jan-Feb 98, p. 4, Doc III-147. The AFATDS software being sent to the 1st Cavalry Division at Fort Hood and other operational units was analog. See Memorandum for Command Historian's Office, subj: Access to Oral History Materials, 13 Apr 98, Doc III-148.

building on the previous one.[168]

[168]Ibid., p. 4; Memorandum for Command Historian's Office, subj: Access to Oral History Materials, 13 Apr 98.

As TSM AFATDS pointed out, this software fielding format produced training challenges. Units had to train and qualify operators at fielding, had to furnish sustainment training on existing software, and had to provide training on each software version as it was delivered. For example, the Task Force XXI version of AFATDS was immature and untested. In an effort to optimize the experimental software, combat developers and software engineers continued to issue improvements right up until the start of the AWE. The battalion literally loaded new software as it prepared for the AWE. As a result, operators and leaders neither fully understood nor were trained on the new software.[169]

In view of this and the time lost because of unexpected software problems, the Army and TSM AFATDS concluded that they had to modify the fielding format. They had to permit time for training to be completed. For example, in the sixty days preceding the Division AWE of late 1997 that followed the Task Force XXI AWE, the unit received no new software changes so that training could take place. This gave leaders and operators confidence with the software and their ability to fight digitally. Also, the Division AWE indicated that the Army and TSM AFATDS had to expedite fixes identified by commanders into the software and get them to field sooner so that training could be completed.[170]

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[169]Ibid., pp. 3-4.

[170]Ibid., p. 4.

LIST OF ACRONYMS

ABCS, Army Battlefield Control System
AC, Active Component/Assistant Commandant
ACH, Annual Command History
ACOE, Army Communities of Excellence
ACR, Armored Cavalry Regiment
ACTD, Advanced Concept Technology Demonstration
ADA, Air Defense Artillery
ADLP, Army Distance Learning Plan
AFAS, Advanced Field Artillery System
AFATDS, Advanced Field Artillery Tactical Data System
AGR, Active Guard Reserve
AHR, Annual Historical Review
AIT, Advanced Individual Training
ARAC, Army Radar Approach Control
ARARNG, Arkansas National Guard
Army TACMS, Army Tactical Missile System
ARNG, Army National Guard
ARTEP, Army Training and Evaluation Program
ASARC, Army System Acquisition Review Council
ASARDA, Assistant Secretary of Army for Research, Developmen
ATACMS, Army Tactical Missile System
ATACS, Advanced Target Acquisition Counterfire System
ATC, Artillery Training Center
ATCAS, Advanced Towed Cannon System
ATCCS, Army Tactical Command and Control System
ATD, Advanced Technology Demonstration
ATDL, Army Training Digital Library
ATTD, Advanced Technological Transition Demonstration
AWE, Advanced Warfighting Experiment
BAT, Brilliant Antiarmor Submunition
BCD, Battlefield Coordination Detachment
BFIST, Bradley Fire Support Vehicle
BNCOC, Basic Noncommissioned Officer Course
BRAC, Base Realignment and Closure
CAN, Campus Area Network
CAS3, Combined Arms Services Staff School
CATS, Combined Arms Training Strategy
CATT, Combined Arms Tactical Trainer
CBI, Computer Based Instruction
C3, Command, Control, and Communications
C4I, Command, Control, Communications, Computers, and Intelligen
C2I, Command, Control, and Information
CCTT, Close Combat Tactical Trainers
CEIHOT, Center for Environmental Initiatives and Hands-on Training
CG, Commanding General

CGSC, Command and General Staff College
CIS, Central Instrumentation Systems
CLASS, Closed Loop Artillery Simulation System
CMF, Career Management Field
COB, Command Operating Budget
COBRA, Counterbattery Radar
COLT, Combat Observation Lasing Team
CONUS, Continental United States
CPX, Command Post Exercise
CSSG, Close Support Study Group
CTSC, Collective Training Control Subsystem
DA, Department of the Army
DAB, Defense Acquisition Board
DAC, Deputy Assistant Commandant/Department of the Army Civilian
DAIG, Department of the Army Inspector General
DCA, Directorate of Community Activities
DCD, Directorate of Combat Developments
DCP, Directorate of Civilian Personnel
DEQ, Directorate of Environment Quality
DIS, Distributed Interactive Simulation
DOC, Directorate of Contracting
DOD, Department of Defense
DOIM, Directorate of Information Management
DOL, Directorate of Logistics
DOPMA, Defense Officer Personnel Management Act
DPTM, Directorate of Plans, Training, and Mobilization
DPW, Directorate of Public Works
DRM, Directorate of Resource Management
DSARC, Defense Systems Acquisition Review Council
DSTATS, Digital Systems Test and Training Simulator
DTE, Directorate of Training and Evaluation
DTTP, Doctrine, Tactics, Techniques, and Procedures
EMD, Engineering and Manufacturing Development
EPLRS, Enhanced Position Location Reporting System
ER, Extended Range
ETC, Environmental Training Center
FA, Field Artillery
FADAC, Field Artillery Digital Automated Computer
FAOAC, Field Artillery Officer Advanced Course
FAOBC, Field Artillery Officer Basic Course
FAS, Field Artillery School
FAST, Future Army Schools Training
FATC, Field Artillery Training Center
FDC, Fire Direction Center
FDTE, Force Development Test and Evaluation
FF, Firefinder
FIST, Fire Support Team
FISTV, Fire Support Vehicle
FLIR, Forward Looking Infrared
FM, Field Manual
FORSCOM, U.S. Army Forces Command
FOTE, Follow-on Test and Evaluation
FSATS, Fire Support Automated Test System
FSCAOD, Fire Support and Combined Arms Operations Department

FSCATT, Fire Support Combined Arms Tactical Trainer
FSC3, Fire Support Command, Control, and Communications
FSCL, Fire Support Coordination Line
FSO, Fire Support Officer
FSTS, Fire Support Training Strategy
FTX, Field Training Exercise
FY, Fiscal Year
GAO, General Accounting Office
GD, Gunnery Department
GLPS, Gun Laying Positioning System
GOSC, General Officer Steering Committee
GPS, Gobal Positioning System
GSM, Ground Station Module
GUARDFIST II, Guard Unit Armory Device-Full-Crew Interactiv
G/VLLD, Ground/Vehicular Laser Locator Designator
HCT, Howitzer Crew Trainer
HIMARS, High Mobility Artillery Rocket System
HMMWV, High Mobility Multipurpose Wheeled Vehicle
HQ, Headquarters
HQ DA, Headquarters, Department of the Army
IET, Initial Entry Training
IFCS, Improved Fire Control System
IFSAS, Interim Fire Support Automated System/Initial Fire Support Au
ILMS, Improved Launcher Mechanical System
IOTE, Initial Operational Test and Evaluation
IPDS, Improved Positioning Determining System
JORD, Joint Operational Requirements Document
JPSD, Joint Precision Strike Demonstration
JRTC, Joint Readiness Training Center
JSTARS/Joint STARS, Joint Surveillance Target Attack Radar System
KEI, Key Enabling Initiative
LAN, Local Area Network
LLDR, Lightweight Laser Designator Rangefinder
LLDRF, Lightweight Laser Designator-Ranger Finder
MACS, Modular Artillery Charge System
MAPS, Modular Azimuth Positioning System
MICOM, U.S. Army Missile Command
MILES, Multiple Integrated Laser Enagement System
MLRS, Multiple-Launch Rocket System
MOA, Memorandum of Agreement
MOS, Military Occupational Specialty
MOTE, Mission Operational Test and Evaluation
MRL, Multiple Rocket Launcher
MSE, Multiple Subscriber Element
MTP, Mission Training Plan
NBC, Nuclear, Biological, and Chemical
NCO, Noncommissioned Officer
NCOA, Noncommissioned Officer Academy
NCOES, Noncommissioned Officer Education System
NEPA, National Environmental Policy Act
NET, New Equipment Training
NETD, New Equipment Training Detachment
NTC, National Training Center
OAC, Officer Advanced Course

OBC, Officer Basic Course
OCONUS, outside Continental United States
ODS, Operation Desert Shield/Operation Desert Storm
OMA, Operations and Maintenance, Army
OMB, Office of Management and Budget
OPA2, Other Procurement Army 2
OPMS, Officer Personnel Management System
ORD, Operational Requirements Document
OSD, Office of the Secretary of Defense
PCS, Permanent Change of Station
PEO, Program Executive Officer
PERSCOM, Personnnel Command
PM, Program Manager
PME, Professional Military Education
POI, Program of Instruction
POM, Program Objective Memorandum
P3I, Preplanned Product Improvement
RAM, Reliability, Availability, and Maintainability
RAMS, Rocket and Missile Systems
RC, Reserve Component
RFPI, Rapid Force Projection Initiative
RIF, Reduction-in-Force
SADARM, Sense-and-Destroy Armor Munition
SATS, Standard Army Training System
SAWE, Simulated Area Weapons Effect
SDR, Surrogate Data Radio
SINCGARS, Single Channel Ground and Airborne Radio
SSM, Surface-to-Surface Missile
STRICOM, U.S. Army Simulation Training and Instruction Command
TACFIRE, Tactical Fire Direction System
TADSS, Training Aids, Devices, Simulators and Simulations
TASS, Total Army School System
TATS, Total Army Training Strategy
TDA, Tables of Distribution and Allowances
TDY, Temporary Duty
TELS, Transporters, Erectors, and Launchers
TF, Task Force
TMD, Theater Missile Defense
TNET, Telecommunications Satellite Network
TOE, Table of Equipment
TRADOC, U.S. Army Training and Doctrine Command
TSM, TRADOC System Manager
TSP, Training Support Package
TSSAM, Tri-Service Stand-off Attack Missile
TTP, Tactics, Techniques, and Procedures
USACGSC, U.S. Army Command and General Staff College
USAF, U.S. Air Force
USAFAC, U.S. Army Field Artillery Center
USAFACFS, U.S. Army Field Artillery Center and Fort Sill
USAFACS, U.S. Army Field Artillery Center and School
USAFAS, U.S. Army Field Artillery School
USAFATC, U.S. Army Field Artillery Training Center
USAG, U.S. Army Garrison
USAR, U.S. Army Reserve

VSEL, Vickers Shipbuilding and Engineering Limited
VSIP, Voluntary Separation Incentive Program
VTT, Video Teletraining
WIDD, Warfighting Integration and Development Directorate
WRAP, Warfighting Rapid Acquisition Program
ZBB, Zero Base Budget

APPENDIX ONE
STUDENT PRODUCTION FOR FISCAL YEAR 1997

Course	Initial Input	Graduates
FA Officer Advanced Course	555	492
FA Officer Basic Course	l,477	1,074
Basic Noncommissioned Officer		

Courses	340	336
Advanced Noncommissioned Officer Courses	135	132
Platoon Leader Development Courses	456	439
Total	2,962	2,473
U.S. Army Field Artillery Training Center (Basic Combat Training, One Station Unit Training, Advanced Individual Training, and U.S. Marines)	17,946	16,996
Grand Total for FY 1997	20,908	19,469

Source: Msg, NCOA to Dastrup, subj: NCOA Student Production Statistics, 16 Apr 98, Doc I-49; Memorandum for Record, subj: Student Production Statistics from US Army Field Artillery Training Center, 13 Apr 98, Doc I-50; Msg, 30th Regiment to Dastrup, subj: Input to 1997 USAFACFS Annual Command History, 28 Apr 98, Doc I-51.

APPENDIX TWO
KEY TRAINING COMMAND PERSONNEL

Commandant and Chief of Field Artillery:
MG Randall L. Rigby, 7 Jun 95-7 June 97
MG Leo J. Baxter, 7 June 97-present

Assistant Commandant and Deputy Commanding General-Training:

BG William J. Lennox, Jr., 7 Dec 95-13 Jun 97
BG Toney Stricklin, 13 Jun 97-present

Chief of Staff, Training Command/Commander of the 30th FA Regiment:
Col David C. White, 19 Jun 96-present

Commander, U.S. Army Field Artillery Training Center:
Col Michael W. McKeeman, 6 Jun 96-present

Noncommissioned Officers Academy:
CSM Jerry L. Wood, -present

Director, Warfighting Integration and Development Directorat
Col Herbert G. Brown, Jun 96-Jan 97
Dr. Phyllis Robertson (acting), Jan 97-Sep 97
Col N.E. Nelson, Sep 97-present

Director, Directorate of Combat Developments:
Col Kermit Edney, Jr., 1 Sep 95-present

Director, Gunnery Department:
Col H.K. Anderson, Jul 96-present

Director, Fire Support and Combined Arms Operations Department
Col Larry D. Aaron, 28 Oct 96-16 Apr 97
LtCol Charles Adair (acting) 16 Apr 97-18 Aug 97
Col L.G. Swartz, 18 Aug 97-present

Director, Depth and Simultaneous Attack Battle Laboratory:
Col Sammy Coffman, Jul 96-present

Director, Office of the Chief of Field Artillery (reestablished by MG Leo J. Baxter after he became Commandant of the U.S. Army Field Artillery School, Chief of Field Artillery, and Commanding General of U.S. Army Field Artillery Center and Fort Sill)
Col David C. Cutler, Jun 97-

APPENDIX THREE
KEY USAFACFS PERSONNEL

Commanding General/Commandant of U.S. Army Field Artillery:
School/Chief of Field Artillery:
MG Randall L. Rigby, 7 Jun 95-7 Jun 97
MG Leo J. Baxter, 7 Jun 97-present

Chief of Staff:
Col Richard W. Sherwood, 1 Sep 95-17 Apr 97
Col Herbert G. Brown, 17 Apr 97-Oct 97
Col Guy M. Bourn, Oct 97-present

Chief of Staff and Garrison Commander were made two separate p
DOIM, Protocol, and Special Staff.

Base Operations Manager/Deputy Garrison Commander:
James R. Russell, 29 Jun 92-20 Jan 97
Col Herbert G. Brown, 20 Jan 97-17 Apr 97
Col D.J. Bonney, 17 Apr 97-present
Base Operations Manager position dissolved 1 Oct 95
Deputy Garrison Commander dissolved 17 Apr 97
Garrison Commander created 17 Apr 97

Secretary to the General Staff:
Maj C. Easterling, 18 Jun 96-2 Jun 97
Maj R.P. Smith, 2 Jun 97-present

Director, Directorate of Community Activities:
Daniel G. Linehan, Jr., 1 Oct 93-present

Director, Directorate of Civilian Personnel:
John D. Kerr, 29 Sep 96-present

Director, Directorate of Information Management:
J. Parker, 1 Oct 96-present

Director, Directorate of Logistics:
T.S. Haymend, 12 May 96-present

Director, Directorate of Contracting:
Bernie Valdez (acting), Sep 96-Jan 97
(permanent), Jan 97-present

Director, Directorate of Resource Management:
Col Robert L. Hansen, Jr., 8 Jul 96-present

Director, Directorate of Public Works:
Col Paul R. Nelson, 1 Nov 95-7 Dec 97
Dennis J. Hergenrether (acting) 7 Dec 97-present

Director, Directorate of Environmental Quality:
R.O. Barnett, 1992-present

Director, Directorate of Plans, Training, and Mobilization:
LTC C.E. Ellis, Mar 96-Sep 97
Col Herbert G. Brown, Oct 97-present

Commander, III Corps Artillery:
BG Colby M. Broadwater, 28 Oct 96-present

APPENDIX FOUR
LIST OF PAST FIELD ARTILLERY SCHOOL COMMANDANTS

CPT Dan T. Moore, l9 Jul l9ll-l5 Sep l9l4
LTC Edward F. McGlachlin, Jr., l5 Sep l9l4-26 Jun l9l6
School was closed 26 June 1916-27 July 1917
COL William J. Snow, 27 Jul l9l7-26 Sep l9l7
BG Adrian S. Fleming, 26 Sep l9l7-ll May l9l8
BG Laurin L. Lawson, ll May l9l8-l8 Dec l9l8
BG Dennis H. Currie, 24 Dec l9l8-l0 Jun l9l9
BG Edward T. Donnely, 30 Jun l9l9-9 Jul l9l9
MG Ernest Hinds, 25 Oct l9l9-l Jul l923
MG George LeR. Irwin, l Jul l923-l Apr l928
BG Dwight E. Aultman, 6 Apr l928-l2 Dec l929
BG William Cruikshank, 8 Feb l930-3l Jul l934
MG Henry W. Butner, l7 Sep l934-l0 Mar l936
BG Augustine McIntyre, 29 Jun l936-3l Jul l940

BG Donald C. Cubbison, l Aug l940-22 Dec l940
BG George R. Allin, 20 Jan l94l-30 Jun l942
BG Jesmond D. Balmer, l Jul l942-ll Jan l944
MG Orlando Ward, l2 Jan l944-30 Oct l944
MG Ralph McT Pennell, 3l Oct l944-30 Aug l945
MG Louis E. Hibbs, 30 Aug l945-4 Jun l946
MG Clift Andrus, 20 Jun l946-15 Apr l949
MG Joseph M. Swing, 9 Apr l949-3l Mar l950
MG Arthur M. Harper, 2 Apr l950-l6 Nov l953
MG Charles E. Hart, 4 Jan l954-28 May l954
MG Edward T. Williams, 8 Jul l954-23 Feb l956
MG Thomas E. de Shazo, l2 Mar 1956-31 Jan 1959
MG Verdi B. Barnes, l5 Feb 1959-25 Mar 196l
MG Lewis S. Griffing, 6 Apr 196l-3l Mar 1964
MG Harry H. Critz, l Apr 1964-l5 May 1967
MG Charles P. Brown, 5 Jul 1967-20 Feb 1970
MG Roderick Wetherill, 24 Feb 1970-3l May 1973
MG David E. Ott, l Jun 1973-24 Sep 1976
MG Donald R. Keith, 9 Oct 1976-2l Oct 1977
MG Jack N. Merritt, 22 Oct 1977-26 Jun 1980
MG Edward A. Dinges, 27 Jun 1980-27 Sep 1982
MG John S. Crosby, 28 Sep 1982-3 Jun 1985
MG Eugene S. Korpal, 4 Jun 1985-17 Aug 1987
MG Raphael J. Hallada, 20 Aug 1987-19 Jul 1991
MG Fred F. Marty, 19 Jul 1991-15 Jun 1993
MG John A. Dubia, 15 Jun 1993-7 Jun 1995
MG Randall L. Rigby 7 Jun 1995-7 Jun 1997
MG Leo J. Baxter, 7 Jun 1997-present

This list represents the most accurate information currently available at Fort Sill and supercedes previous lists. Since World War I, the School Commandant has also served as post commander of Fort Sill.

APPENDIX FIVE
CHIEFS OF FIELD ARTILLERY

*MG William J. Snow, 15 Feb 1918-19 Dec 1927
*MG Fred T. Austin, 20 Dec 1927-15 Feb 1930
*MG Harry G. Bishop, 10 Mar 1930-9 Mar 1934
*MG Upton Birnie, Jr., 10 Mar 1934-24 Mar 1938
*MG Robert M. Danford, 26 Mar 1938-9 Mar 1942
BG George R. Allin, 20 Jan 1941-31 Jun 1942
BG Jesmond D. Balmer, l Jul l942-ll Jan l944
MG Orlando Ward, l2 Jan l944-30 Oct l944
MG Ralph McT Pennell, 3l Oct l944-30 Aug l945
MG Louis E. Hibbs, 30 Aug l945-4 Jun l946
MG Clift Andrus, 20 Jun l946-15 Apr l949
MG Joseph M. Swing, 9 Apr l949-3l Mar l950
MG Arthur M. Harper, 2 Apr l950-l6 Nov l953
MG Charles E. Hart, 4 Jan l954-28 May l954
MG Edward T. Williams, 8 Jul l954-23 Feb l956

MG Thomas E. de Shazo, l2 Mar 1956-31 Jan 1959
MG Verdi B. Barnes, l5 Feb 1959-25 Mar 196l
MG Lewis S. Griffing, 6 Apr 196l-3l Mar 1964
MG Harry H. Critz, l Apr 1964-l5 May 1967
MG Charles P. Brown, 5 Jul 1967-20 Feb 1970
MG Roderick Wetherill, 24 Feb 1970-3l May 1973
MG David E. Ott, l Jun 1973-24 Sep 1976
MG Donald R. Keith, 9 Oct 1976-2l Oct 1977
MG Jack N. Merritt, 22 Oct 1977-26 Jun 1980
MG Edward A. Dinges, 27 Jun 1980-27 Sep 1982
*MG John S. Crosby, 28 Sep 1982-3 Jun 1985
*MG Eugene S. Korpal, 4 Jun 1985-17 Aug 1987
*MG Raphael J. Hallada, 20 Aug 1987-19 Jul 1991
*MG Fred F. Marty, 19 Jul 1991-15 Jun 1993
*MG John A. Dubia, 15 Jun 1993-7 Jun 1995
*MG Randall L. Rigby 7 Jun 1995-7 Jun 1997
*MG Leo J. Baxter, 7 Jun 1997-present

*Individuals with an astrisk by their name were officially recognized by the Department of War or Department of the Army as the Chief of Field Artillery. The War Department created the Office of the Chief of Field Artillery on 15 February 1918 to supervise the Field Artillery. On 9 March 1942 the War Department abolished the Office of the Chief of Field Artillery as part of a general wartime reorganization and placed the Field Artillery under the Army Ground Forces. In 1983 the Department of the Army reestablished the Chief of Field Artillery to oversee the development of Field Artillery tactics, doctrine, organization, equipment, and training. Although the War Department and later the Department of the Army did not recognize an official Chief of Field Artillery from 1942 through 1983, the Commandants of the U.S. Army Field Artillery School and its predecessors during those years considered themselves to be the Chief of Field Artillery.

APPENDIX SIX
DOCUMENTS

The following documents form the basis of the 1997 Annual Command History, are on file in the Command Historian's Office, U.S. Army Field Artillery Center and Fort Sill, and are available for use upon request.

CHAPTER ONE

I-1. War Department, General Order No. 72, 3 Jun 1911.
I-1A. Official Biography, MG Leo J. Baxter.
I-2. Change of Command Ceremony Program, 6 Jun 97.
I-3. "Baxter to Command Fort Sill," Fort Sill Cannoneer, 8 May 97.
I-4. "Lennox Departing for Fort Hood," Fort Sill Cannoneer, 5 Jun 97.
I-5. Official Biography, BG Toney Stricklin.
I-6. Memorandum for See Distribution, subj: Beginning FY97 Funding Operations, 28 Oct 96.

I-7. Msg, subj: FY97 Continuing Resolution Authority Msg 5 Released, 7 Oct 97.

I-8. Msg, subj: FY 1997 Continuing Resolution Authority Msg 4, 1 Oct 97.

I-9. Msg, subj: FY 1997 Continuing Resolution Authority Msg, 26 Sep 96.

I-10. Briefing, subj: FY97 Appropriation Markup, Jan 97.

I-11. Memorandum for See Distribution, subj: FY98 TRADOC Budget Guidance, 29 Apr 97.

I-12. Briefing, subj: FY98 TRADOC Budget Guidance, undated.

I-13. Briefing, subj: FY98 TRADOC Budget Guidance, May 97.

I-14. Memorandum for See Distribution, subj: FY97 Appropriation TRADOC Budget Guidance, undated.

I-15. Memorandum for See Distribution, subj: FY97 Appropriation TRADOC Budget Guidance, 8 Jan 97.

I-16. Memorandum for See Distribution, subj: FY97 Administrative Instruction for the Phased Obligation Plan on the Appropriations TRADOC Budget Guidance, 10 Jan 97.

I-17. Memorandum for See Distribution, subj: FY98 Command Operating Budget - KEI Investments and Unfinanced Requirements, 12 Jan 97.

I-18. Msg, Barbara Miliam, Directorate of Resource Management, to Jimmy Parker, Directorate of Information Management, subj: Priorities for FY98 KEIs, 19 Jun 97.

I-19. KEI Summary, 1 Jul 97.

I-20. FY98 Command Operating Budget (Extract), 1 Jul 97.

I-21. Memorandum for See Distribution, subj: FY98 COB - Phase II OMA TRADOC Budget Guidance, 13 May 97.

I-22. Memorandum for See Distribution, subj: FY COB - Phase I Administrative Instruction, 6 May 97.

I-23. Memorandum for See Distribution with Encls, subj: FY98 BASOPS Opportunity Leveraging and Development (BOLD) Grants, 7 May 97.

I-24. Memorandum for See Distribution, subj: FY98 BASOPS Opportunity Leveraging and Development (BOLD) Grants, 12 Jan 98.

I-25. Briefing, subj: FY98 BOLD Grants, Jul 97.

I-26. Memorandum for See Distribution with Encls, subj: FY98 Appropriation TRADOC Budget Guidance, 13 Jan 98.

I-27. Briefing, subj: FY98 Appropriation Markup, 15 Jan 98.

I-28. "Sixty-three Jobs Targeted for Elimination at Fort Sill," Fort Sill Cannoneer, 29 May 97.

I-29. "RIF Notices Issued," Fort Sill Cannoneer, 31 Aug 97.

I-30. Msg, Sandy Mayhall, Directorate of Civilian Personnel, to Command Historian, subj: Annual Command History, 23 Jan 98.

I-31. Interview, Dastrup with Karen Jordan, Management Division, Directorate of Resource Management, 8 Jan 98.

I-32. "Chaffee Garrison Colors to be Cased Saturday,"

Fort Sill Cannoneer, 25 Sep 97.
I-33. "Chaffee Garrison Colors to be Cased at Ceremony," Fort Sill Cannoneer, 18 Sep 97.
I-34. Briefing, subj: Fort Chaffee BRAC Update, 4 Dec 97.
I-35. Memorandum for See Distribution, subj: Summary of 4 Dec 97 BRAC IPR for the Chief of Staff, 8 Dec 97.
I-36. Msg, Henry Holzheuser, Chief, Plans and Operations Branch, Directorate of Plans, Training, and Mobilization, to Sandy Posey, Directorate of Plans, Training, and Mobilization, subj: Annual Historical Review Ops--Training Division, 18 Dec 97.
I-37. Msg, Henry Holzheuser, Chief, Plans and Operations Branch, Directorate of Plans, Training, and Mobilization, to Dastrup, subj: Annual Historical Review Ops--Training Division, 6 Jan 98.
I-38. Operations Order 87-012, Annex A.
I-39. Fact Sheet, subj: Fort Sill's ARAC, 29 Mar 96.
I-40. Briefing, subj: Fort Sill Air Traffic Control, 1997.
I-41. Interview, Dastrup with Mitch Pinion, Deputy Director, Directorate of Plans, Training, and Mobilization, 8 Jan 98.
I-42. Memorandum, Directorate of Plans, Training, and Mobilization to Suzanne Hogan of U.S. Congressman J.C. Watt's Office, 2 Apr 97.
I-43. Memorandum for Record, subj: Historical Funding Trend, 8 Jan 98.
I-44. Memorandum of Agreement between the U.S. Army and U.S. Air Force Concerning Approach Control Services for Fort Sill, Oklahoma, Mar 97.
I-45. Memorandum, subj: Protected Airspace for Non-radar Missed Approach Procedures at Lawton Municipal Airport, 19 May 94.
I-46. Memorandum for Chief of Staff, subj: Fort Sill, ARAC, 9 Nov 95.
I-47. Memorandum for Command Historian, subj: Annual Command Historical Review, 22 Jan 98.
I-47A. Memorandum for Dr. Dastrup, Command Historian, subj: 1997 USAFACFS Annual Command History, 19 Mar 98
I-48. Memorandum for Command Historian, subj: Annual Command History-Directorate of Environmental Quality CY 1997, 10 Dec 97.
I-49. Msg, NCOA to Dastrup, subj: NCOA Student Production Statistics, 16 Apr 98.
I-50. Memorandum for Record, subj: Student Production Statistics from US Army Field Artillery Training Center, 13 Apr 98.

CHAPTER TWO

II-1. "Field Artillery Training Command," Field Artillery, Nov-Dec 97.
II-2. Briefing, subj: BCT/OSUT Conference, 20-21 Nov

97.

II-3. Memorandum for Record, subj: Information Obtained from COL Michael McKeeman, Cdr, Field Artillery Training Center, on 17 Dec 97.

II-4. Interview, Dastrup with COL Michael McKeeman, Cdr, Field Artillery Training Center, Fort Sill, 17 Dec 97.

II-5. Msg, COL McKeeman to AC, USAFAS, subj: BCT Conference After Action Report, undated.

II-6. Interview, Dastrup with Sharon Dorrell, WIDD, 15 Jan 98.

II-7. Memorandum for Sharon Dorrell, WIDD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.

II-8. Memorandum for Command History Program, subj: Input for 1997 Annual Command History, 7 Apr 98.

II-8A. "Field Artillery Training Command," Field Artillery, Nov-Dec 97.

II-9. Memorandum for Cdr, TRADOC, subj: Distance Learning/Classroom XXI OPLAN, 6 Nov 97.

II-10. "Technological Advances in Training," Field Artillery, Mar-Apr 97.

II-11. Memorandum for Command Historian, subj: Training Development Products for WIDD, 7 Apr 98.

II-12. Interview, Dastrup with Tom Carr, Integration Division, WIDD, 21 Jan 98.

II-13. "Technological Advances in Training," Field Artillery, Mar-Apr 97.

II-14. "Technological Advances in Training," Field Artillery, Mar-Apr 97.

II-15. Msg, subj: Input for Classroom XXI History, 13 Feb 98.

II-16. Memorandum for Director, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97.

II-17. Memorandum for Record, subj: OBC Revisions, 18 Feb 98.

II-18. Interview, Dastrup with COL J.K. Anderson, Director, GD, 16 Dec 97.

II-19. Interview, Dastrup with MAJ D.A. Vindich, Chief, Officer Instruction Branch, GD, 27 Jan 98.

II-20. "Lightfighter FCE Coming to FAOBC," Field Artillery, May-Jun 97.

II-21. Information Paper, subj: Dismounted Fire Support Officer Coordination Exercise, 18 Aug 97.

II-22. Interview, Dastrup with MAJ Grant H. Thomas, FSCAOD, 30 Jan 98.

II-23. Fact Sheet, subj: Dismounted Fire Support Officer Fire Control Exercise, 30 Jan 98.

II-24. Memorandum for MAJ Grant Thomas, FSCAOD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.

II-25. Memorandum for Director, FSCAOD, subj: 1997 USAFACFS Annual Command History, 18 Mar 98.

II-26. Interview, Dastrup with COL L.G. Swartz, Director, FSCAOD, 16 Dec 97.

II-27. Memorandum for See Distribution with Encl, subj:

CPT PME Action Plan, 7 Aug 97.
II-28. Briefing, subj: CPT PME, 30 Jan 98.
II-29. Draft POI.
II-30. Memorandum for Record, subj: Executive Summary of CPT PME Council of Colonels, 17 Nov 97, 12 Jan 98.
II-31. Memorandum for Record, subj: Executive Summary for CPT PME General Officer Steering Committee VTC, 30 Jan 98, 12 Jan 98.
II-32. Fact Sheet, subj: Field Artillery Pre-Command Course, undated.
II-33. Interview, Dastrup with LTC M.T. Dooley, Deputy Director, FSCAOD, 15 Jan 98.
II-34. Interview, Dastrup with CPT Chris Reynolds, Chief, Fire Support Automation Branch, Command and Control Division, FSCAOD, 13 Feb 98.
II-35. Memorandum for USAFAS, subj: AFATDS Distance Learning Course Requirements, 22 Aug 97.
II-36. Memorandum for Red Team 6, subj: Suggestions for AFATDS Distance Learning Courses, 5 Aug 97.
II-37. Memorandum for 1st Cavalry Divarty and USAFAS, FSCAOD, subj: AFATDS Leaders' Course and Distance Learning, 12 Nov 97.
II-38. Msg, subj: AFATDS Distance Learning, 19 Feb 98.
II-39. Msg, subj; AFATDS Distance Learning Training, 12 Jan 98.
II-40. Msg, subj: Distant Learning with 1st Cavalry, 3 Nov 97.
II-41. Fact Sheet, subj: MLRS NETDs, 15 Nov 97.
II-42. Interview, Dastrup with MAJ Jonathan Brooks, New Equipment Training Branch, GD, 11 Feb 98.
II-43. Fact Sheet, subj: Division Accomplishments, 16 Dec 97.
II-44. Memorandum for Cdr, 1/37 FA, subj: Paladin NET Final Report - 1st Battalion, 37 FA, 25 Nov 97.
II-45. Interview, Dastrup with CPT Mark Strong, Paladin NET Team, GD, 28 Jan 98.
II-45A. Interview, Dastrup with CPT Mark Strong, Paladin NET Team, GD, 26 Jan 98.
II-46. Memorandum for Adjutant Generals of All States, Puerto Rico, Virgin Islands, Guam, and the District of Columbia, subj: Active Guard Reserve Authorizations and Controlled Grades for Paladin, 1 Mar 97.
II-47. "Redlegs Need for ARNG Paladin NET," Field Artillery, Jan-Feb 97.
II-48. Interview, Dastrup with LTC David Annen, Chief, Unit Training Division, WIDD, 14 Jan 98.
II-49. Memorandum for LTC David Annen, WIDD, subj: 1997 USAFACFS Annual Command History, 12 Feb 98.
II-50. Fact Sheet, subj: Division Artillery Staff Training Driver, 2 Jan 98.
II-51. "FSCATT: Close-Loop Training of the FO, FDC, and Howitzer Section," Field Artillery, Jul-Aug 97.
II-52. Fact Sheet, subj: FSCATT, 6 Jan 98.
II-53. Dr. Linda G. Pierce and Walter W. Millspaugh,

"Simulations to Train and Develop the 21st Century FA," Field Artillery, Jul-Aug 97.

II-54. Msg, Bo Bielinski, Chief, Doctrine Branch, WIDD, to Command Historian, subj: Contracting out Manuals, 11 Feb 98.

II-55. Interview, Dastrup with B. Bielinski, Doctrine Branch, WIDD, 28 Jan 98.

CHAPTER THREE

III-1. MG Leo J. Baxter, "Honing the Edge: State of the Field Artillery 1997," Field Artillery, Nov-Dec 97.

III-2. MAJ Vince C. Weaver, Jr., "Fires in AWE Focus Dispatch: A Step Toward Task Force XXI," Field Artillery, Mar-Apr 96.

III-3. Msg, HQ DA to Cdr, TRADOC, subj: Enlisted Grade Growth, undated.

III-4. Msg, subj: EPMD Update #5, 21 Jun 96.

III-5. Briefing, subj: Enlisted Grade Growth, 2 May 96.

III-6. Msg, HQ DA to Cdr, TRADOC, et al, subj: Enlisted Grade Growth, 18 Jun 96.

III-7. Fact Sheet, subj: NCO Reduction, 3 Jul 96.

III-8. SGM Wayne S. Hashimoto and CSM William J. Perry III, "FA NCO: Restructuring, FY 2000," Field Artillery, Sep-Oct 96.

III-9. Msg, Cdr, FORSCOM, to Cdr, I Corps, et al, subj: Staffing of NCO Restructuring Initiative, 100800Z Feb 97.

III-10. Memorandum for Record, subj: Reducing NCO Grade Growth, undated.

III-11. Msg, HQ DA to Cdr, TRADOC, subj: Enlisted Grade Growth, 271205Z Jun 96.

III-12. Memorandum, subj: Change in NCO Structure, 17 Jul 96.

III-13. Fact Sheet, subj: CINCOS, undated, in Senior Fire Support Conference Packet, 9-13 Feb 98.

III-14. Briefing, subj: Reduction in NCO Structure, 25 Jun 96.

III-15. Briefing, subj: Reduction in NCO Structure (Draft), Jul 96.

III-16. Memorandum with Encls, subj: NCO Grade Growth, 19 Jun 96.

III-17. Msg, HQ DA to Fort Sill, et al, subj: NCO Restructure, 28 Jun 96.

III-18. Msg, Hashimoto to Maple Pollack, subj: NCO Restructure, 4 Feb 97.

III-19. Fact Sheet, subj: Change in NCO Structure, 14 Jan 98.

III-20. Memorandum, MG Randall L. Rigby, Cdr, USAFACFS, to LTG Theodore G. Stroup, Jr., Deputy Chief of Staff for Personnel, 1 Jul 96.

III-21. CSM William J. Perry III to Hashimoto, subj: CINCOS Update, 31 Mar 97.

III-22. LTC Rhett A. Hernandez and MAJ Terry M. Lee, "OPMS XXI: What Does It Mean for Your Future," Field

Artillery, Sep-Oct 97.
III-23. Briefing, subj: An Officer Corps for the 21st Century, OPMS XXI," 1997.
III-24. Officer Guide, "What is OPMS XXI."
III-25. LTC Donald J. Burnett, "Officer Personnel Management System XXI," Army Research, Development, and Acquisition, Sep-Oct 97.
III-26. CPT Brayton Harris, "At Long Last: DOPMA. . .How Long Will It Last?" U.S. Naval Institute Proceedings, Sep 81.
III-27. LT Greg D. Rowe, "What Happened to the Pyramid?" U.S. Naval Institute Proceedings, Jul 97.
III-28. Msg, subj: DOPMA, 19 Feb 98.
III-29. Briefing, subj: OPMS XXI Recoding, Aug 97.
III-30. Briefing, subj: FA Recoding, 7 Oct 97.
III-31. Briefing, subj: FA Recoding, 10 Dec 97.
III-32. Interview, Dastrup with LTC W. Rigby, Chief, Field Artillery Proponency Office, 20 Jan 98.
III-33. USAFAS, Proposed Operational Concept for Field Artillery Experimentation in Task Force XXI (Draft), ca. 1995.
III-34. MG Leo J. Baxter, "Honing the Edge: State of the Field Artillery 1997," Field Artillery, Nov-Dec 97.
III-35. Focus Dispatch Fire Support After Action Review Comments, undated.
III-36. Memorandum for See Distribution, subj: Focused Dispatch AWE Fire Support Observations from the Live/Virtual Exercise (Executive Summary), 15 Sep 95.
III-37. Briefing, subj: Focused Dispatch, 5 Sep 95.
III-38. Prairie Warrior 1996, Key Fire Support Insights (Extract) taken from Executive Summary, Final Report.
III-39. Task Force XXI Experiment Directive (Extract), undated.
III-40. Msg, subj: CSA 97-05 Random Thoughts While Running, 30 Apr 97.
III-41. Task Force XXI Final Report, Executive Summary, Oct 97.
III-42. COL Thomas R. Goedkoop and CPT Barry E. Venable, "Task Force XXI: An Overview," Military Review, Mar-Apr 97.
III-43. COL Steven A. Emison, "Post Task Force XXI Advanced Warfighting Experiment," Army Research, Development, and Acquisition, Sep-Oct 97.
III-44. TRADOC Pamphlet 525-5, Force XXI Operations, 1 Aug 94.
III-45. CPT Henry M. Hester, Jr., "Digitization in Task Force XXI," Field Artillery, Sep-Oct 96.
III-46. Fact Sheet, subj: Task Force XXI, undated.
III-47. Briefing, subj: Task Force XXI, undated.
III-48. Briefing, subj: Fire Support Initiatives, undated.
III-49. LTC Douglas G. Beley, "AFATDS and the Task Force AWE," Field Artillery, Jan-Feb 98.
III-49A. Briefing, subj: Task Force XXI in Support of AWE, Feb 98.
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